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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Boon or Bane?

Will electronic funds transfer be a boon or bane for consumers? Consumer activist Patrick S. Portway looks at some of the pros and cons of the developing systems beginning on Page 14.

DP Budgets Grow 10% As Salaries Rise 11% Over '77 Expenditures

By Jeffry Beeler
CW Staff

DP budgets for large systems users will average about 10.6% more in 1978 than in 1977, according to a recent *Computerworld* survey of 27 major U.S. firms.

Much of the reported DP budget increases, which ranged from 4% to 32%, resulted from rising labor costs, the survey suggests.

Nineteen (70%) of the respondents cited salaries as the expense item that had risen most sharply during recent years. Maintenance ranked as the second most inflationary budget category with five mentions, and supplies, which was named four times, ranked third. (Some companies said more than one expense item had risen fastest in cost.)

Among the respondents, DP salary increases this year will average about 11.2%, with 2% and 30% representing the low and high ends of the pay-raise scale, the survey found. Salary hikes appeared to be fairly uniform for all job categories including managers, systems analysts and programmers.

Partly because of the rising pay scale, respondents cited labor as the single largest expense item in their DP budgets. On the average, salaries accounted for nearly half (48.6%) of the participants' DP expenditures.

Mainframes and peripherals constituted the second largest budget share — 32.9% — among the relatively few respondents that could give a detailed breakdown of their DP spending.

Still Hiring

Despite these rising labor costs, about 70% of the companies replying to the survey said they planned to hire new DP personnel in 1978.

One firm intends to add only one or two employees to its DP staff, while

(Continued on Page 4)

Costs, Privacy Hazards Feared

OMB Asked to Delay TAS Funding

By Edith Holmes
CW Staff

WASHINGTON, D.C. — Six senators have written to the Office of Management and Budget (OMB) protesting Internal Revenue Service (IRS) efforts to include a controversial computer system for tax administration in the 1979 budget request the President will soon send to Congress.

Fearing the Tax Administration System's (TAS) projected costs and its potential for "jeopardizing the constitutional rights and the rights of privacy of American citizens," the senators asked OMB Director James P.T. McIntyre to defer funding for the system until its potential impacts receive further study.

They added their voices to the chorus of complaints about TAS begun by Representatives John E. Moss (D-Calif.), Dante B. Fascell (D-Fla.) and Charles Rose (D-N.C.). These congressmen sent their latest series of letters to the Secretary of the Treasury, the IRS commissioner and the House and Senate appropriations subcommittees on Oct. 31, expressing "serious misgivings" over the proposed system.

Waiting for Report

In particular, Senators James Abourezk (D-S.D.), Edmund S. Muskie (D-Maine), Charles H. Percy (R-Ill.), Abraham Ribicoff (D-Conn.), Birch Bayh (D-Ind.) and Charles M.C. Mathias Jr. (R-Md.) want the OMB to stall funding until Congress receives a General Accounting Office (GAO) report, expected in March, on the system.

"Although this report is just one analysis in the deliberative process, it is expected that it will comprehensively evaluate the merits of the proposed system as it relates to its technical components, as well as the privacy impact on individual citizens," the senators wrote.

They plan to ask the GAO to expand its examination of TAS and the congressional Office of Technology Assessment (OTA) to reinstitute its study of last February which first labeled the system a constitutional rights risk [CW, Feb. 21].

OMB held a meeting here last week to consider the senators' letter and appeals from IRS Commissioner Jerome Kurtz, who contends the IRS must upgrade its DP system to the distributed TAS if it is to continue to meet the demands of tax accounting and taxpayer service.

Several meetings have been held regarding TAS, according to OMB's associate program director, Dennis Green. No decision was reached last week on whether to recommend that

(Continued on Page 7)

NCR 'Clarifies' Upkeep Policy On Resold Units

By Don Leavitt
CW Staff

DAYTON, Ohio — Although it started a furor last summer, NCR's change in policy with regard to maintenance service on its equipment sold by others [CW, Sept. 5] is more apparent than real, according to a follow-up memo from E.F. Shipman, the firm's vice-president for domestic marketing.

His recent statement was intended to clarify NCR's policy in the face of "some misinterpretation" of the firm's August memo, Shipman said. But the clarification — still not widely distributed — included a paragraph calling for an inspection/certification procedure to be followed before NCR equipment sold by a non-NCR organization would qualify for maintenance support from the company.

The new memo also said the certifica-

(Continued on Page 4)

IBM Moves for Mistrial, Cites Change in Definition

By Catherine Arnst
CW Staff

NEW YORK — IBM recently filed a motion for mistrial in the U.S. vs. IBM antitrust case on the grounds that, nine years after this action was started, the government is "dramatically changing its market definition claim virtually at the end of its direct case."

If Judge David N. Edelstein grants IBM's motion in full, the trial would be aborted and the government would have to retry the case from scratch.

But the judge also has several other choices.

He could merely suspend the trial and allow IBM to cross-examine government witnesses again on the new issues or prohibit the government from changing or expanding its market definition.

If he denies the motion, IBM could appeal the issue to the U.S. Court of Appeals through a writ of mandamus. However, IBM lead attorney Thomas Barr refused to say how far he would take the issue.

The government has not yet filed its response.

The trial issues were limited by Edelstein in 1975 to those defined in gov-

(Continued on Page 2)

Memorex Soon

SAN FRANCISCO — The Memorex Corp. vs. IBM antitrust trial is slated to start Jan. 16 with the selection of a jury. Opening statements will begin Jan. 23.

The previously set date of Jan. 9 was cancelled in order to allow for more pretrial hearings.

Judge Samuel Conti held hearings Dec. 27-29 and again Jan. 4, when he denied IBM's motion for a summary judgment. There will also be a hearing Jan. 13.

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IBM Files for Antitrust Mistrial

(Continued from Page 1)

ernment papers, which alleged that IBM monopolized the "general-purpose digital computer system market." However, that definition of such a system bears no relation to the one given recently by Dr. Alan K. McAdams, the government's chief economic witness in this case, IBM charged.

"Earlier witnesses ... have testified in ways we deem to be inconsistent with the plaintiff's market definition. We take it, however, that since Dr. McAdams is not only a witness, but an active member of the trial staff, that he speaks for the government," IBM's memorandum in support of its motion stated.

McAdams' definition of the general-purpose computer system is "fundamentally different" from the government's definition in two ways, according to IBM: "The definition of the relevant market is made peculiarly time-dependent, with as many as five different definitions for five different time periods," and "in each time period there is asserted a unique defined or described market."

The government "has repeatedly and continually over the more than six years of discovery and 31 months of trial claimed a single, nontime-dependent systems market totally inconsistent with what its claim now appears to be," the firm said.

"Prejudice to defendant from this eleventh hour change is cast and irremediable. [IBM] has been misled and has been denied, in probably the longest trial in history, a reasonable opportunity to know the claims of the opposing party and to meet them," the defendant's memorandum said.

'Fish or Cut Bait'

Barr, commenting on the motion, said the government must either "fish or cut bait" — adopt McAdams' definition as part of its case or acknowledge that the witness is speaking independently of the government, he said.

As for a solution, Barr said IBM would be content with either a fresh cross-examination of the witnesses on the new issues or a prohibition on the government's expansion or change of its market definition.

"I would never suggest that we should start from scratch ... we would throw out some and keep some," Barr said. "But this is a problem which I cannot cure" during the course of the trial because most of the government witnesses have already been called," he said.

The firm based its motion on a Supreme Court opinion written in 1938 (Morgan vs. U.S.), which defined the "fundamental requirements of fairness which are the essence of due process." One such requirement was that "a right to a hearing embraces ... a reasonable opportunity to know the claims of the opposing party and to meet them," the Supreme Court ruled.

"Throughout the almost nine-year history of this litigation, there was no notice of any kind of new, still-changing and unrefined definition" used by McAdams, IBM charged.

The definition laid out in the government's statement of triable issues reads "general-purpose electronic digital computer system means ... systems generally included in a manufacturer's commercial product line and comprises the hardware, software and services necessary to perform a broad range of commercial applications as the primary function of the system."

McAdams helped to draft that definition and other similarly worded trial papers — the pretrial brief, "The Economic Analysis of the Market for General-Purpose Electronic Digital Computer Systems" and the amended complaint. However, he described that definition as "incomplete" and said it "does not deal at all with the definition of a general-purpose computer system as I have used it for the period '72-'73," he testified. His newest definition was arrived at "sometime in the last year," McAdams said.

Market definition is the cornerstone of the government's case, because Section 2 of the Sherman Act, under which this action was brought, requires proof of the possession of monopoly power in the relevant market. "The definition of a relevant market must follow a strictly applied test ... Congressional policy demands and most courts have recognized that a relevant market for antitrust purposes must be narrowly and precisely defined, reflecting the competitive realities of the marketplace," according to the government's "Memorandum on Market Definition for Antitrust Purposes."

Government attorney Lewis Bernstein took the position in court that McAdams' testimony "should be separated from any legal contentions that counsel for the parties may have with respect to market," but added his testimony is perfectly consistent with the government's allegations."

Under cross-examination, McAdams testified that the definition of a general-purpose system has changed over time and that definition "has different requirements as of different time periods ... The words 'general-purpose computer system' are unfortunate in one sense, and it is very clear that different people use those words with widely varying meanings ... Since the words as they are used generally in the computer industry mean so many different things to so many different people, it is unfortunate that those are the words that happen to be used."

This statement is at odds with the government's claim in the opening days of the trial that "the term 'general-purpose' used in describing a computer system manufactured and marketed primarily for the performance of a broad range of commercial or business data processing applications is a usage of this term which is well recognized in the industry."

McAdams defended his testimony by stating it was actually not the definition that had changed over time — "What has been changing and evolving is the computer system, and as the computer system changed and evolved, I have been recognizing those characteristics of the computer system which qualify it under the single definition."

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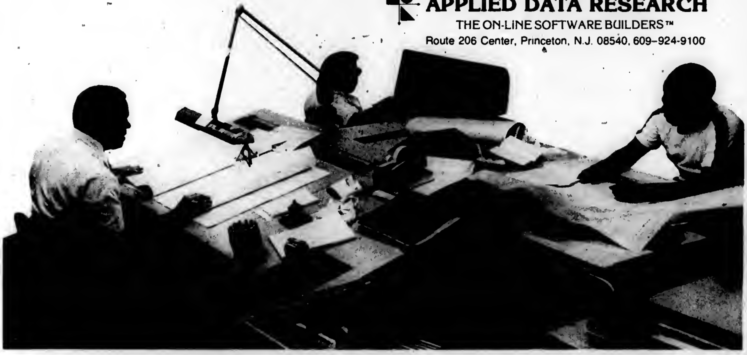

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Salaries Show Biggest Gain in '78 DP Budgets

(Continued from Page 1)

two others plan to hire as many as 20 new staffers. The typical respondent, however, will add eight or nine individuals to its DP department — primarily systems analysts and programmers, with a sprinkling of data entry personnel and computer operators.

Most of these new staffers will assume their positions during the first quarter or first half of this year, the respondents said.

DP budgets for large systems users have risen steadily during the last five years, and the trend shows no sign of abating in 1978, the survey found.

Twenty (74%) of the companies participating in the survey reported that their DP budgets had increased each year between 1972 and 1977. Only one company said the amount it spends for DP had fallen steadily during that period, while the remaining six firms said their budgets had fluctuated.

Pace Accelerating

What's more, for many of the respondents, the pace of budget increases appears to be accelerating. More than a third (37%) of the respondents said their budget hikes were greater in 1977 than in previous years, and 23 (85%) of the companies predicted their 1978 DP expenditures would jump compared to last year's budgets.

Computerworld's *annual budget survey was conducted this year by staff writers Jeffry Beeler, Ann Dooley, Tim Scannell and Brad Schultz.*

Five (18.5%) of the firms, meanwhile, said their 1977 DP budgets will remain about the same as in the past five years, and three (11.1%) foresaw little difference between this and last year's expenditures. Only four (14.8%) of the participants reported that their 1977 DP budgets were less than in 1972-76, and only one company predicted a spending cut in 1978.

CW based the survey on interviews with top DP officials representing an assortment of industries including manufacturing, service, insurance, banking and transportation. Worldwide DP expenditures for the participating companies, which were predominantly IBM users, ranged from $1.5 million to $100 million per year, and annual gross revenues varied from $240 million to $7.5 billion.

The average yearly DP budget for the respondents was $24.6 million; the average gross revenues, $1.82 billion.

Hardware Trends

In other findings, the survey showed that most companies plan either to boost or maintain their budgets for medium- and large-scale computer hardware during the coming year. More than half (51.8%) of the respondents plan a 3% to 40% budget increase for this category, while another third of the companies intend to keep their 1978 expenditures at 1977 levels.

Slightly more than one-fourth of the survey population has definite plans to acquire new medium and large-scale computer hardware this year — primarily IBM 370s and 3031s — but most of the respondents (almost 63%) expressed uncertainty about their equipment acquisition plans. The remaining 12% of the companies said they have no plans to buy or rent new mainframes or mainframe peripherals during 1978.

Twenty-three of the responding firms also reported that they use minicomputers. Applications for these minis include process control, data entry and collection, teleprocessing, general accounting functions, power management, word processing, scientific research and other jobs.

The largest share of the survey population (40.7%) pays for its minicomputer equipment from the DP budget, while exactly one-third of the companies require that minis be bought through the various user departments, the study found. Slightly more than 11% of the firms acquire minicomputer hardware both through the DP budget and user departments, and 14.8% declined for various reasons to explain how they obtain their minis.

Of the 14 companies that pay for minis at least partly from their DP budgets, exactly half predicted that the minicomputer portion of their DP budgets will rise this year — in most instances by at least 20%. Another four firms said they would spend about as much for minis in 1978 as they did last year, and the other three organizations either admitted they had not yet calculated their current minicomputer budgets or declined comment.

Data-Entry Budgets

Elsewhere in the survey, 16 (59.3%) of the respondents revealed that they include the cost of data entry solely in the DP budget, while only one company reported that user departments alone pay for that service. The remaining firms said they divided data-entry expenses between the DP budget and the user departments.

Eleven companies reported that they bill users for data entry, whereas 13 said they don't bill users.

Respondents gave diverse answers when asked about their 1978 data-entry budget plans. Seven (nearly 26%) of the companies predicted their data-entry expenditures would rise this year, while four forecast a decline, and 10 said their data entry spending would remain stable.

Most of the budget hikes for data entry proved modest (usually only about 2%-10%), while some of the spending cuts were more drastic, sometimes as much as 25%-50%, the survey found.

NCR Details Upkeep Policy

(Continued from Page 1)

tion would be done "expeditiously," taking no more than 90 days, unless a real problem were encountered. Meant as an assurance that the inspection would be completed within that time frame, that statement was interpreted by some — erroneously, according to NCR — to mean all NCR systems involved in third-party sales would be excluded from maintenance for 90 days.

However, equipment that "has been removed from maintenance for a period of more than three months" prior to its sale to a new owner "does not automatically qualify" for a maintenance contract, according to the "information for new users" printed on the back of NCR's new certification form.

That warning apparently became mixed in some users' thinking with the 90-day reinstallation period to create the impression that NCR was prohibiting maintenance support for the first 90 days of a new organization's ownership of used NCR gear, the firm indicated.

The August memo required all equipment sold by anyone other than NCR to be inspected by NCR prior to approval for maintenance services. At the time, users and dealers understood the existing policy required such inspections only if the equipment had been out of service for more than 60 days.

There also seemed to be a change in who would pay for what as a result of the inspection. The pre-August policy limited charges billed to the new owner to such items as in-transit damage. The now-clarified summertime statement said the cost of services needed to put the equipment into satisfactory condition would be borne by the prospective buyer.

Installation and certification costs will be on a time-and-materials basis, Shipman's recent memo said. Charges to the customer will be made to cover installation expense, such as cabling the unit, or system, physical and technical inspection and hardware diagnostic procedures, he specified.

Charges will also be made for software diagnostic procedures, replacement of defective modules, installation of any necessary modifications and "other work required to place the equipment in acceptable condition for reliable operation," he said, but added that "replacement parts and/or modules required will be charged to the customer."

But he added the company does not intend to support non-NCR equipment added by third parties to NCR systems. "Nor can we support unauthorized modifications made by third parties to NCR equipment."

Proposal Book Rocks Industry!

A California publishing firm has literally taken the computer industry by storm with a recently-published "how-to" proposal book. The book, a 4½ pound looseleaf volume entitled *How to Create a Winning Proposal*, covers every aspect of proposal preparation from start to finish, including the nuts-and-bolts details on how a winner is put together.

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To Allay Privacy Concerns

Europeans to Press for Data Flow Rules in '78

By G. Russell Pipe
Special to CW

AMSTERDAM, The Netherlands — The coming year will end the speculation about the impact of transborder data controls on U.S. interests abroad and confront data processors with some specific, costable dislocations with which to grapple.

Regulations covering the transmission of data across national boundaries entail much more than privacy legislation, although privacy concerns remain the centerpiece of national and international attention. The Swedish Data Act is to be expanded and toughened, Germany will implement its Data Protection Act and the French are expected to begin transitional phases of a data processing and freedom law.

Already these measures are being seen as possible vehicles for greater government regulation of DP that could involve influencing equipment and services deemed preferable for domestic users. Witness the French parliamentary debate [CW, Dec. 12] and the stringent technical and physical security demands contained in the German law.

Privacy, national dependency on computing, trends toward societal conformity and vulnerability, plus greater centralization of governmental powers, are issues which forthcoming national "data policies" may address. Next year should see Austria, Denmark and Norway adopting data protection laws with Belgium, Luxembourg and Spain not far behind.

National public data networks and the vast Euronet project will approach operational stages while the postal, telephone and telegraph (PTT) authorities' desired "volume-sensitive pricing" nears resolution.

Associations such as the Council of Europe and probably the Organization for Economic Cooperation and Development (OECD) and European Economic Community will be accelerating programs beyond the initial stages of international agreements ranging from personal data to general international DP practices.

U.S. Response

Evaluating the effectiveness of U.S. reaction to all of these developments may be more appropriate in terms of the commitment to action than in precise initiatives to date. The formidable U.S. contingent at the OECD Vienna Symposium last fall and the constructive overview presented by John Richardson, director of the Office of Telecommunications, demonstrated a strong government-industry willingness to go forward.

The institutional response by the Department of State, National Security Council, congressional committees and trade associations underscores the fact that the issues are being researched and positions formulated. If recent history is a guide, these moves are a preview to more potent developments.

The restlessness of the DP industry, however, has understandable merit. Undoubtedly the impact of dislocations will hit manufacturers, services and users in a haphazard way and U.S. government response may be difficult to marshal.

It remains to be seen whether American Embassies will have the available skills and manpower to deal with the problems on a country and case basis. Similarly, the implications of such "standards," as they are described in the jargon of nontariff and invisible barriers to trade, must be measured by multinationals on a five- to 10-year time frame for planning. Calculating the impacts on network building, for example, still seems to be a matter of guesswork.

An indirect problem may be Washington's lack of coordination or coherence in developing national information, computer and communications policies. Several European governments recognize the need for rational policy and institutional solutions; seeing the U.S. in disarray doesn't help advance international cooperation in an "information age."

Analysis

Perhaps the new Assistant Secretary of Commerce for Telecommunications and Information can fill the breach, at least on the international scene.

A common complaint by DPers is the lack of sufficient hard information about what's going on and what it means. This is attributable in part to developments which are moving from Europe to America, reversing the usual pattern of information flow on computer-communications technology.

Further, nearly all of the available reporters are European nationals, whether corporate managers or journalists, who just don't seem to see much urgency in the subject.

The OECD Vienna Symposium proved useful, although fewer facts were offered than some were anticipating. Reports emanating from the Council of Europe, through U.S. and other observers, may be constricted as negotiations leading to an interna-

(Continued on Page 6)

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Europeans to Press for Privacy Rules in '78

(Continued from Page 5)

tional convention grow more sensitive.

Most of the key actors in the field seem far more interested in communications channels with local interests than in foreign news coverage. Take, for example, the Swedish Data Inspection Board's recent decision in a case where a Swedish bank has been sending manual files containing mostly economic information to Luxembourg for processing.

Until now, the board did not consider manual files leaving Sweden to be within its jurisdiction. Its responsibilities were activated when terminal access, magnetic tape or card media were involved. Now organizations which move paper files will need a license if they will be automatically processed abroad.

This new action has not been reported outside Sweden, to my knowledge, but it may have important international effects.

Conference Slated

An international conference on transnational data regulation, designed to find practical approaches to solving this array of problems, is scheduled for Brussels Feb. 7-9. It has already attracted considerable U.S. interest, with scheduled speakers including W.M. Combs, Tymnet; John Eger, formerly acting director of the Office of Telecommunications Policy (OTP); William Fishman of OTP; Phil Onstad of Control Data Corp.; Rein Turn, TRW; T. Utsumi, Global Information Services; Phil Walker, Telenet; and Charles Wilk, U.S. Office of Telecommunications.

Literally all of the principal Europeans and industry spokesmen are to be participating. Eger, now associated with the law firm of Lamb, Halleck and Keats in Washington, is coordinating information on the conference.

Getting a feeling for the issues is necessary before moving into fixed national positions or beginning negotiations with other countries. The strengthening of European counterparts by such trade groups as the Association of Data Processing Service Organizations, the Computer and Business Equipment Manufacturers Association and the Information Industry Association is the type of effort which should be of considerable value. Giving greater attention to such related forums at Unesco and the 1978 Intergovernmental Conference on Strategy and Policies in Informatics in Madrid will give U.S. interests an opportunity to be heard as well as to sense the feelings of developing countries toward worldwide data communications.

Assessing the Issues

It is incorrect to lump all European countries into the same basket on all these issues. This is especially true for countries that are just beginning to consider major new DP projects or raising priorities on telecommunications services.

It should not be taken for granted that the UK with its tremendous banking and commercial data movements will be party to some of the proposals currently being considered. Also, the free trade-oriented governments of Holland and Belgium have yet to consider these matters.

This having been said, collective policymaking on the continent is growing, and most of these issues have spilled over every national boundary. All countries are backing privacy legislation, and most want to develop stronger national computer-communications policies having important economic ramifications.

All except Spain have government-owned telecommunications authorities and many are building public data networks. Further, several are wary about too much dependence on computer technology for political and economic reasons.

Fears of Socialists

In the socialist regimes, the notion of sovereignty and national independence are alive and on the rise, and the concept of free flow of information is being challenged, the Helsinski doctrine notwithstanding.

The expressions of Canadian officials in the media and DP field are very close to those expressed in Europe. The developing countries are keenly aware of the impact of mass communications, but they have yet to frame a "new international information order" to include computer-communications. It is likely they soon will.

Unpleasant as some of these topics are to some, there is little chance of their being wished away or stalled by benign neglect. The coming year will surely evoke rhetoric, but those with vital commercial interests should be feeling the consequences of these developments as well.

French Concerned Over Access to Records

Special to CW

PARIS — The Committee for the Free Access to Information has been formed by two members of the French Polytechnical School.

Michel Raoust and Jean Claude Lepage are seeking an amendment to the "Data Processing and Liberty" legislation that, like provisions of the Freedom of Information Act in the U.S. and Swedish open record principles, gives public access to government records.

The committee favors including manual files under the law and proposes that the commission established by the legislation be required to help citizens obtain access to records maintained by the government. The group is independent of all political and labor groups.

This expression of concern for freedom of information in France, while only recently appearing in an organized form, is likely to continue to gain more visibility and support when the new parliament sits next year, observers believe.

Correction

In the editorial "Too Late Now" [CW, Dec. 26-Jan. 2], an error changed the meaning of a key sentence. The correct version should have read: "It is ironic that consumers were hard-pressed to identify with the noncompetitive concepts of the earlier 'Consumer' Act, but are now directly affected by an industry proposal that makes no mention of them."

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Concern Over TAS Privacy Grows

(Continued from Page 1)

Congress fund the system in fiscal year 1979, and OMB isn't sure when it will make that decision, Green said.

The senators sent their letter to OMB because "it has come to our attention that the OMB is prepared, in the immediate future, to make an affirmative decision regarding the funding and subsequent implementation of this system."

Costs — an estimated $851 million — and constitutional rights dictate caution in approving and setting up the system, the senators said, noting that several congressional committees, including the Senate's Subcommittee on Administrative Practice and Procedure and its Committee on Governmental Affairs, the Joint Committee on Taxation and the Oversight Subcommittee of the House Ways and Means Committee, are interested in TAS.

"We especially feel the necessity to have specific facts spelled out regarding the constitutional issues so we can be assured all potential abuses in these areas have been clearly identified and specifically addressed in the TAS system or any alternatives," they stated in the letter to OMB.

Privacy at Issue

Chairman of the Senate Administrative Practice and Procedure Subcommittee, Abourezk was further dissatisfied with assurances given a member of his subcommittee staff by Patrick J. Ruttle, IRS assistant commissioner of data services, concerning TAS' potential privacy impacts.

Abourezk last week sent a letter to Kurtz asking several of the questions raised by OTA in its study of nearly a year ago.

The IRS attempted to answer OTA's contentions that TAS will give the agency the capability for increased information abuse by providing the "potential for surveillance, harassment or political manipulation of [tax] files" in a status report on the system's development issued last May.

For the IRS, the replacement of its 20-year-old centralized tax accounting and collection system is essential, and the agency considers privacy and security issues to be concerns running parallel to taxpayer service, Ruttle said in an interview last spring [CW, April 11].

He detailed the administrative and system safeguards the IRS plans to employ to protect taxpayer privacy, including such safety measures as preemployment screening, supervisory reviews of unauthorized access at all levels of management, an extensive system of terminal profiles and strict limitations on the use of the terminals planned for TAS.

Members of Congress, however, want more details concerning the safeguards the IRS will use under TAS.

Moss and Rose last year asked the House and Senate Appropriations Committees to refuse approval of the system in principle and to deny funding for procurement even in a miminal manner until the IRS has satisfied congressional misgivings about the potential abuses of taxpayer information contained in TS [CW, April 11].

Possible Abuses

The congressmen were particularly concerned about OTA projections that TAS could hook up with banks around the nation to check on the daily balances of businesses and individuals.

They also expressed their worry over the fact that by fiscal 1979, the Social Security Administration (SSA) and IRS will be required by law to share income and tax data on all W-2 forms. This requirement could mean a direct link between the computers of the two federal agencies, pooling more data on individuals than any other federal agencies, Moss and Rose said.

For Dr. Ruth M. Davis, former director of the National Bureau of Standards' Institute for Computer Sciences and Technology and a member of the OTA panel that reviewed TAS, the issue is the acceptable levels of risk the American public can tolerate in a system like TAS.

She encouraged the kind of dialogue between Congress and the IRS that compares and weights the risks and benefits associated with TAS.

Stag to Make Hearing Plans

BURLINGAME, Calif. — The California Board of Equalization has agreed to hold a public hearing April 5 on Tax Regulation No. 1502 on automatic data processing services and equipment, according to a spokesman for the Sales Tax Action Group (Stag), an organization that requested the hearing.

Stag will discuss plans for that hearing at an open meeting Jan. 11 at 6:30 p.m. at the Sheraton Inn here.

Stag is asking the Board of Equalization to review the regulation on the grounds that its application has been inconsistent and does not reflect current technology.

Correction

Alan Hruska, an attorney with Cravath, Swaine & Moore recently assigned to the defense team of the U.S. vs. IBM antitrust trial, is not related to Roman Hruska, former senator from Nebraska [CW, Dec. 19]. David Boies is leaving the case to become chief counsel to the Senate Judiciary Committee's Antitrust and Monopoly Subcommittee.

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If Used by Federal Government

DP-Planned Menus Seen $3 Million/Day Saver

By Tim Scannell
CW Staff

AMHERST, Mass. — The federal government could save more than $3 million a day on the National School Lunch Program if a computer were used to plan and coordinate its menus, according to Joseph Balintfy, a professor here at the University of Massachusetts.

Using a Control Data Corp. Cyber computer programmed with such information as food preference, sequence of eating and budgetary and nutritional considerations, Balintfy claims to have found menus that are not only economical, but more readily accepted by students.

To do this for a particular school, the computer is first programmed with the results of a food preference survey performed to determine what the students like to eat and how often, he said. These facts are collated into an "anticipated satisfaction group" based upon the frequency of what is served.

All the menu items offered by the school are then entered into the computer according to their nutritional benefits and cost per serving. This usually amounts to 120 to 150 different selections, Balintfy said.

The resulting output is a menu based on preference that meets budgetary standards, satisfies nutritional requirements and offers the students the food they like, he said.

Balintfy's computerized theory was tested with 1,000 students in the Amherst and Easthampton, Ma., school systems and resulted in less food being thrown away and a cost savings of 12.5 cents per student per day, he said.

Students actually preferred the computer-planned menus because they were served foods they liked to eat without sacrificing nutrition, he stated.

Balintfy believes using a computer is the only way to organize and catalog the variables of menu planning.

"We have a powerful tool in the hands of food experts. With this tool we can make predictions as to what direction managerial or nutritional assumptions should be explored," he said.

"It is humanly impossible to find the optimum mixture in menu planning," he continued. Using a computer is "the only way we can evaluate the nutritional and preference aspect of a combination of items over a longer period of time."

Opposed by Nutritionists

Although Balintfy has great faith in his system and its concepts, he finds his ideas are opposed by the majority of nutritionists he has approached.

"There is an interdisciplinary gap," he stated. "The educational background of food and nutritional experts is conspicuously void of any mathematical background.

"It is beyond the comprehension of an individual even with a Ph.D. in nutrition as to what can be done with mathematics," he added.

Balintfy believes his theories are rejected mainly because they will eventually result in a reduction of present nutritional budgets. "I haven't seen a food service director yet who wanted to cut his budget," he contended.

A teacher in the School of Business Administration, Balintfy has been doing reasearch on mathematical models of the human diet for the past 15 years. "This is just the latest application — to the school system. I have been developing applications for other institutional food services such as hospitals and even the military," he said.

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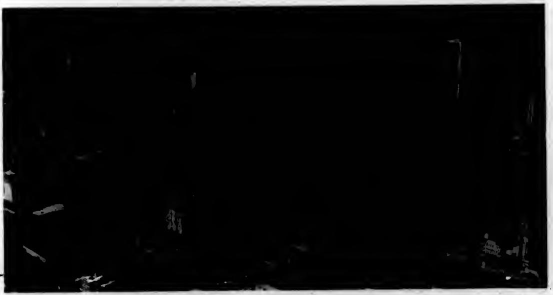

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Keeps In-House Analysts

Firm Economizes by Jobbing Out Most Coding

By Brad Schultz
CW Staff

CHICAGO — A medium-sized manufacturing firm decided to job out the bulk of its software production rather than have in-house programmers because it could not get enough people with experience nor afford to train beginners.

This idea proved "excellent and productive" and would work for other firms with around $150 million in annual sales in the same predicament, according to Eugene R. Tauber, DP manager of the Joslyn Manufacturing and Supply Co. here.

Joslyn's DP staff now consists of "technical professionals with a business orientation" whose prime function is to:

- Interpret user requirements.
- Develop detailed specifications of the project request.
- Coordinate the development.
- Manage the interface with the software house.
- Test the new system.
- Implement the new applications.
- Finalize documentation.

"The chore of the actual coding is gone, leaving the true creative design management function," Tauber said.

Joslyn now maintains a staff of analysts rather than programmers, Tauber noted, making the following distinction between these two professional types: "Really top programmers are principally technicians engrossed by necessity in the workings of the hardware and software," whereas "top analysts are application- or user-oriented, considering the computer only a tool for performing a given job faster than can be done by human power."

A firm's information systems department exists to provide information for administrative decision-making and financial reporting, in Tauber's opinion, and thus needs capable and suitably oriented analysts.

Economical Alternative

He found that by contracting out all coding jobs to top programmers, Joslyn could meet its need for analysis and programming at a much lower price and without having to pay high-priced technicians for "fixing small problems, waiting for the next assignment, drinking coffee and taking vacations," he said.

"And should the need to reduce or expand output capacity arise, the change can be effected quickly without an employment agency fee," Tauber added.

In the past year, Joslyn manufactured and sold $156 million in equipment for the utilities industry. In that period, the firm spent $19,000 in jobbing out software support for a 23-installation data network under development, extensive modification of a general ledger system and updating an inventory control system.

That sum would have been exhausted merely in paying the salary of one experienced programmer, he pointed out.

Tauber said that firms undertaking this procedure should be guided by some words of caution:

Always use a firm in close proximity to your shop — it saves travel time and general headaches waiting for response, he said.

Always use a fixed bid, he advised, but remember that changes in the original specifications will incur an additional charge.

Use a penalty clause for late delivery of code. Joslyn uses 10% of the fixed bid price per day. Some firms won't accept this, but Joslyn won't accept late delivery, he said.

Work with the outside software house to get the best understanding of what the job really is. If it doesn't understand what you want, you both will be disappointed.

Start using this concept slowly. It will take a little time to find a few software houses that are reliable and whose prices are fair, he noted.

Resource Requirements

Be sure to have your technical people estimate resource requirements prior to contacting your "outsiders," and compare this time estimate with that of the outside bid, he said.

You may have to use more than one organization because of multiple machines with different languages. Joslyn has minicomputers and a mainframe, and sometimes it has used one

(Continued on Page 13)

How to train your COBOL programmers in structured programming for $15 per student

When it comes to structured programming, the trainer's or manager's problem is twofold. First, he must decide which of the several methods of structured programming to teach. Second, he must decide how to teach the method. Up till now, neither decision has been easy, and it's little wonder that training in structured programming has been largely ineffective.

Now, I'm happy to announce a book by Paul Noll called *Structured Programming for the COBOL Programmer*. In my opinion, this book makes a major contribution to programmer productivity, because it does two things that haven't been done before. First, it presents a method for using structured programming that is complete, consistent, and practical. Second, it presents this method in a way that is educationally effective. In short, as you will see later, we guarantee that a programmer can learn to develop structured programs using the book alone. And that a programmer's productivity will increase as a result of this training.

Why Paul's Method Is Effective

It's not so much that Paul Noll has created a new method for using structured programming. It's more that he has refined and coordinated existing methods into a complete and workable system.

For instance, Paul uses IBM's HIPO for documenting his structured programs. Because IBM's implementation of HIPO is so cumbersome, however, he has developed his own HIPO subset . . . one that is easy to use.

Similarly, Paul has no objection to some of the existing methods for designing programs. It's just, he says, that they don't go far enough. They don't tell what type of modules belong at what level of the structure chart; they don't present a practical system for numbering the modules; and they don't relate the modules in the structure charts to the COBOL paragraphs. Furthermore, no one book or course presents a complete system for developing structured programs that includes design, documentation, coding, and testing.

In contrast, Paul's method is complete. He starts by telling you in detail how to design programs using structure charts. Next, he shows you how to create HIPO diagrams for each of the modules in the chart using his HIPO subset. Then, he shows you how to code the structured program using structured COBOL. Here, you will see how each paragraph in the COBOL program relates to one module in the structure chart. Finally, Paul shows you how to use top-down coding and testing to improve testing efficiency.

4 Reasons Why this Book Is Effective

1. This book was written by an expert from industry, Paul Noll. He has been a software specialist for a large company in San Francisco, and he is currently responsible for the training of 250 programmers. As a result, his programming methods are superb, and his teaching methods are effective.

2. Paul never presents theory without showing its application. In contrast to other books and courses, this book is based around the development of four different kinds of business programs. Once you see how Paul's method is applied in these programs, you will forever see the value of structured programming.

3. This book is designed specifically for the COBOL programmer. As a result, you will see all of the structured coding techniques in COBOL (and only COBOL). You will also see how design and documentation are related to the programming language used.

4. This book contains dozens of illustrations taken from all phases of structured programming. You'll see structure charts and HIPO diagrams for each of the four programs developed in this book; you'll see structured COBOL, program stubs, test plans, walkthrough agendas, and much more. In my experience, these illustrations, more than any other factor, determine whether an EDP course is effective . . . and they are the missing ingredient in other structured programming books and courses.

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UCLA's Bush Analyzer Retires to Smithsonian

WASHINGTON, D.C. — The most venerable computer at the University of California at Los Angeles (UCLA) has been saved from the scrap pile by a handful of devoted history buffs and is joining its fellow pioneers here at the Smithsonian Institution.

In the late '40s and early '50s, this Bush Differential Analyzer — now the last working model of its kind — introduced much of Southern California industry to automatic computing, instructed the first student generation in the new art and even starred in two Hollywood movies.

The differential analyzer, often described as "an oversized erector set," was named for and conceived by Prof. Vannevar Bush of MIT in 1931 as the first general-purpose computer.

In 1945, when the newly founded UCLA College of Engineering started shopping for a mechanical analog computer, General Electric offered to construct the differential analyzer for delivery two years hence at a cost of $125,000.

On July 23, 1947, the new machine was ready to face its first numerical problems, but in contrast to today's split-second responses by million-dollar electronic machines, it often took hours and days to run off a set of solutions.

Firms Initiated

Though slow, the differential analyzer was soon fully booked for teaching, research and cooperative contract work with industry.

Nearby Hollywood also discovered the oversized computer, measuring some 31 feet long by 9 feet wide. In the era before "Star Wars" and "Close Encounters," the differential analyzer was the latest in way-out gadgetry, and it performed skillfully in such science fiction epics of the mid-'50s as "When Worlds Collide" and "Earth vs. the Flying Saucers."

However, the glamour was short-lived. With the rapid development of faster and more sophisticated computers, the differential analyzer fell into disuse. From 1960 on, the UCLA engineering school used it mainly for display, although it clanked away occasionally for student and public demonstrations.

Earlier this year, the engineering school decided that the space occupied by the computer was needed for other purposes, and the machine was disassembled in June. Prof. Walter Karplus, chairman of the UCLA computer science department, Linda Merims, former president of the campus computer club, and a few friends cast about for a way to save the old veteran and found a rescuer and buyer in Daniel McCracken, vice-president of the Association for Computing Machinery.

The machine was offered to the Smithsonian Institute, which agreed to add the differential analyzer to its collection of pioneer computers.

NSF Funds ACM Project

NEW YORK — The Association for Computing Machinery has received a grant of $63,826 from the National Science Foundation to continue a project on courses in computer literacy and the impact of computers on society.

The project supported by the new grant will include refinement of an annotated bibliography and the information storage and retrieval system supporting it.

The ACM will also organize and conduct a workshop on computer impact involving individuals without computer training.

Principal investigators are Richard H. Austing of the University of Maryland and Gerald L. Engel of Old Dominion University.

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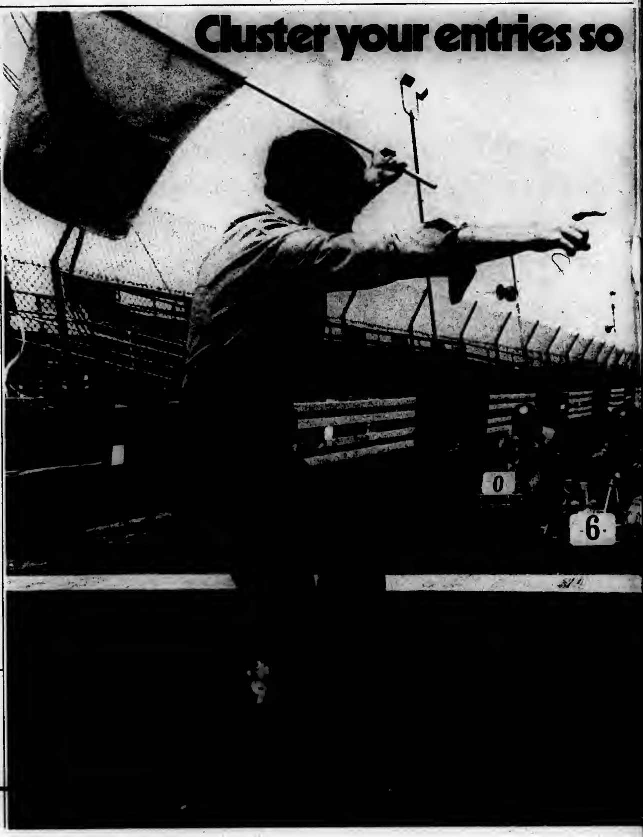

T/S System Lists Houses for Sale

Matching Service Brings Househunters Homes

By Tim Scannell
CW Staff

CONCORD, Mass. — A real estate brokerage firm here can access information on more than 4,000 homes in 41 communities and can reportedly match a home to a person's particular lifestyle with a terminal and a time-sharing service.

The Deignan Co., in conjunction with Interactive Management Systems, Inc., offers customers instant feedback on their inquiries, according to Ted Deignan, originator of the service.

The system consists of two basic and complementary programs, Deignan said. The first is a "buying power system" which evaluates a person's financial picture in relation to the community he has selected.

The second, the "matchmaker system," compare's that person's requirements with what is on file on a day-to-day basis.

Options Detailed

Upon enlisting with the company, a person is asked to fill out a form containing such questions as the amount of cash on hand, securities, salary and approximate monthly expenses, Deignan said. This information is then entered into the remote computer via a Digital Equipment Corp. Decwriter terminal.

Within minutes the customer is given a printout suggesting the maximum advisable home purchasing price and covering the available borrowing options. Financing flexibility is demonstrated by close to 54 mortgaging options at fixed and floating rates of interest ranging from 50% to 95% under conventional and Federal Housing Administration (FHA) financing plans to 100% financing through Veterans Administration loans, Deignan noted.

The customer is also presented with information on loan level, type of loan, advisable purchase price, required down payment, projected monthly payments of interest and principal, closing costs and annual real estate taxes and insurance, he said.

After establishing and inputting a purchase range, a list of possibilities stored on disk is printed from the computer's files and presented to the potential home owner, Deignan said.

'One-Stop Househunting'

If a home is not available that fits a person's needs or desires, his name is inserted into the file and will remain there until a suitable home is found. Deignan termed this "one-stop, we'll never forget you, househunting."

Deignan time-shares on a DEC PDP-11/70 minicomputer at Interactive Management via his terminal and a dial-up telephone line. The Interactive Management system operates in an on-line mode with 640K bytes of memory and is used by Deignan for approximately four hours a day.

The cost of the service varies with the amount of usage, but runs about $800 per month, Deignan said.

By keying in a particular account number and password that can be changed periodically, it is possible to access all of the information within the file, he said.

everybody wins. Mainly you.

You run a wholesale business. Two locations, 3000 customers and growing. But rather than hire more order clerks, you put a computer in your main office. Trouble is, feeding it orders keeps your clerks queued up, your direct line tied up, and your computer idling while your slowest operator taps out 30 words a minute.

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Afips Relocates Washington Staff In Arlington, Va.

WASHINGTON, D.C. — The American Federation of Information Processing Societies, Inc. (Afips) has moved its Washington, D.C., office to larger quarters in nearby Virginia.

The address of Afips' new Capitol office is Suite 805, 1815 N. Lynn St., Arlington, Va. 22209. The telephone number is now (703) 243-3000.

The Washington office was established in 1975 to provide Afips constituent societies with a Washington-based information service and to make technical expertise available to government groups.

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Calendar

Feb. 1-3, Washington, D.C. — **Preserving Management Prerogatives in Privacy Legislation.** Contact: The Institute for Science and Public Affairs, Continuing Education Division, P.O. Box 31, Bejamin Franklin Station, Washington, D.C. 20044.

Feb. 1-3, New York — **Computer Performance Measurement: Tools and Techniques for Increased System Productivity.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 1-3, New York — **Data Communications: An Introduction to Concepts and Systems.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 1-3, Washington — **Word Processing: Guidelines for Planning, Design and Implementation.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 1-3, Chicago — **Data Base Management Systems: General Concepts and Planning Guidelines.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 6-8, Washington, D.C. — **Computer Performance Measurement: Tools and Techniques for Increased System Productivity.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 6-7, Chicago — **Network-based System,** sponsored by the American Institute of Industrial Engineers (AIIE). Contact: AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 6-7, San Francisco — **'EDP Orientation for Administrative, Word Processing and Secretarial Personnel,"** sponsored by the Amerian Institute of Industrial Engineers. Contact: Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 7, Hartford, Conn. — **EDP Auditing,** sponsored by Hartford SigBDP. Contact: Paul Fitterer, Systems Dept., 59 Field St., Torrington, Conn. 06790.

Feb. 7-9, Brussels, Belgium — **International Conference on Transnational Data Regulation,** sponsored by On-Line Conferences Ltd. Contact: Jan Freese, Online Conferences Ltd., Cleveland Road, Exbridge UB8 2DD, Middlesex, England.

Feb. 7-9, Mexico City — **Automation/78,** sponsored by Instrument Society of America. Contact: W.C. Rutledge, Mead Corp. R&D Dept., Chillicothe, Ohio 45601.

Feb. 8, San Francisco — **Expo/3,** sponsored by System/3 Users Group of Northern California. Contact: System/3 Users Group of Northern California, P.O. Box 329, Santa Clara, Calif. 95052.

Feb. 8-9, Chicago — **Network System Design Workshop,** sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 8-10, San Francisco — **Word Processing: Guidelines for Planning, Design and Implementation.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 8-10, Washington, — **Effective Computer Operations Management** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 8-10, San Francisco — **Word Processing Conference,** sponsored by American Institute of Industrial Engineers. Contact: Dept. PR, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 9, Baltimore, Md. — **Data Processing Day,** sponsored by Data Processing Management Association (DPMA). Contact: Bob Davis, Committee Chairman, DPMA, Baltimore Chapter, P.O. Box 22, Baltimore, Md. 21203.

Feb. 9-10, New York — **Minicomputers and Microcomputers: Selection and Usage Guidelines.** Contact: Don Welsher, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 10, San Antonio, Texas — **Structured Programming,** sponsored by the Association for Educational Data Systems (AEDS). Contact: Ralph E. Lee, Director of Computer Center, University of Missouri-Rolla, Rolla, Mo. 65401.

Feb. 12-15, Houston — **Telecommunications Workshop for Bankers,** sponsored by the Operations and Automation Division of the American Bankers Association. Contact: Connie Williams, Operations and Automation Division, American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

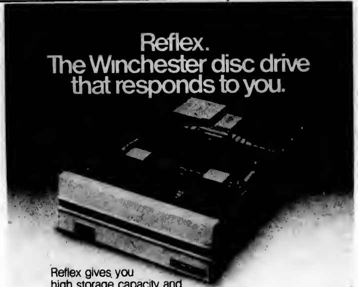
Feb. 12-17, Washington, D.C. — **Annual Meeting of the American Association for the Advancement of Science.** Contact: American Association for the Advancement of Science, Dept. R, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005.

Feb. 13-15, Liege, Belgium — **Symposium on Computer Network Protocols**, sponsored by the International Federation for Information Processing (Ifip) TC.6 and Belgian Chapter (ACM). Contact: A. Danthine, Avenue des Tilleuls 49, B-4000 Liege, Belgium.

Feb. 13-17, Orlando, Fla. — **Second International Learning Technology Congress and Exposition,** sponsored by the Society for Applied Learning Technology. Contact: Dr. Carl R. Vest, Society for Applied Learning Technology, 41 Culpeper St., Warrenton, Va. 22186.

Feb. 14-15, Washington, D.C. — **Data Communications Standards Conference,** sponsored by Data Communications. Contact: McGraw-Hill Conference & Seminar Group, 1221 Avenue of the Americas, Room 3677, New Yokr, N.Y. 10020.

Feb. 14-15, Orlando, Fla. — **Symposium on Air Traffic Control Simulation,** sponsored by the Society for Applied Learning Technology. Contact: Dr. Carl R. Vest, Society for Applied Learning Technology, 41 Culpeper St., Warrenton, Va. 22186.



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'Counterfeit Reality'

Simulation Technique Creates Life-Like Photos

By Catherine Arnst
CW Staff

LOS ANGELES — Computer technology has given this new twist to an old philosophical question: If a tree doesn't fall, but everyone hears it anyway, then does it exist?

That dilemma is raised by "counterfeit reality" — a computerized technique that creates photographs of realistic images that never existed.

Such photographs are the product of a two-year-old project at Information International, Inc. (III). The technique is used to make motion pictures, usually about a minute in length, and is especially useful for special effects and graphics, such as network television logos, according to John Whitney Jr., the project head. Both objects and environments can be created.

The technique could also signal the rebirth of the abstract film movement, which has been dormant since the activity of the 1960s, he said.

Whitney's interest in the computer as an artistic tool stems from his work with abstract films, which he made for about four years. Gradually, his attention shifted from the creative aspect to the mechanical.

Three-Step Technique

His work with the motion picture project is labeled "optic simulation" ("counterfeit reality" is his own coinage) and involves "looking at light in the modern world and figuring out how to simulate it," he said. Three steps are involved.

First, a drawing of the object, must be prepared and then it must be described in terms that can be stored in a computer memory. This information, a three-dimensional description of the object's topology, is stored on tape in III's own FR 80, a data entry system. The data is then transferred to a Gaphics I system, also built by III, which is programmed to smooth the drawing and add shading.

The second step is the testing phase, when the motion picture sequence is recorded on black-and-white film or a vector-type picture on a terminal screen to confirm the visuals.

Finally, the film is made, using 35 mm Eastman Kodak color negatives.

At this point, only very short pieces of film, approximately a minute in length, can be made. It takes three minutes to make one frame of film, and there are 24 frames in a second.

The rather slow turnaround time is based on the running time of a general-purpose computer system, Whitney said. The Graphics I has 256K of memory, which is equivalent to that of a Digital Equipment Corp. System 10.

Previous Strides

The project based much of its programs on early work done on flight simulation and on research by Dr. Ivan Sutherland, of Evans and Sullivan, and University of Utah graduate students.

However, the state of the art has been advanced considerably by III in the last two years and even more advances will be made in the next six months, Whitney said.

"There is a surprising richness we can bring to objects," he said. Although the efforts of the project are targeted toward theatrical works, Whitney does not expect a feature film will be made entirely by this method.

Not only would such an undertaking be too complex technially, it would probably not be artistically valid, he said. "Now films are made with a combination of techniques and talents and that is the way they should be made," he said.

The project members also see the computer only as a tool and not an end in itself. "We are consistently aware that no matter what the lure of technology the creative end must still be there. A lot of what we have to do involves creative energies but it couldn't be done without a computer," he said.

Handicapped Gain DP Jobs

CHICAGO — The Mainstreaming the Severely Disabled Project of the City Colleges of Chicago is placing a number of handicapped individuals in entry-level DP positions as junior programmers, programmer trainees, data entry clerks and keypunchers in the Chicago area.

Programmer trainee candidates and junior programmers have completed a nine-month introduction to DP along with basic Cobol — some with a timesharing option. All have at least a high school diploma and some have junior college and four-year college degrees.

The curriculum studied by the students was developed in conjunction with a business and industry committee composed of DP trainers and specialists from major corporations in the area.

For additional information contact John Longstreet at the Chicago City-Wide College, Room 506, 209 N. Michigan Ave., Chicago, Ill. 60601.

Firm Cuts Costs For Coding Jobs

(Continued from Page 9)

house for each, he said.

Insist on a period of liability during which the house must resolve any detected "bugs." All the major code errors that may not show up with the first testing will usually emerge within 14 to 30 days, according to Tauber.

Document Applications

He added that the users should make sure applications are documented to existing standards and coded according to in-house standards.

All testing must be done on user equipment under current user software. Compatibility with different software releases may be a problem, he pointed out.

Bids must include a work schedule, specifying the number of hours the house will devote day-to-day to each program throughout the period of development. The user's analysts can tell if there is a gross error which may signal a misunderstanding.

Ask for, receive and verify all references of work performed for other clients, Tauber recommended.

Most important, he emphasized, specifications for outside contractors must be well thought out, detailed, extremely clear and concise to be used in the generation of a satisfactory product.

NOTICE TO BIDDERS

City of Philadelphia Water Department. Water Pollution Control Project. Southwest Water Pollution Control Plant. Additions and Modifications · Phase XI Process Computer Monitoring and Control System. Bid. No. 2814 - Division 3e - Equipment and Electrical Work No. SO-522-SW.

Sealed proposals for Additions and Modifications · Phase XI under Work Number SO-522-SW of the Southwest Water Pollution Control Plant Improvements, invited by the Procurement Commissioner, will be received in Room 1385, Municipal Services Building, on April 4, 1978 at 2:30 PM Prevailing Time, at which time and place they will be publicly opened and read aloud.

The work for which Proposals are invited includes the designing, furnishing, and installation of the Process Computer Monitoring and Control System, and all related and appurtenant work.

The Contract Documents, including Instructions to Bidders, Proposal, Federal Requirements, Contract Requirements, Specifications and Plans, may be examined in Room 1360, Municipal Services Building, Philadelphia, Pennsylvania and at the office of Greeley and Hansen, Six Penn Center Plaza, Room 310, Philadelphia, Pennsylvania. Copies of these Contract Documents may be obtained from the City only upon the deposit of a check for $250.00 for each set. The amount of the deposit for each set will be refunded if the documents are returned in good condition within 14 days after the opening of bids.

Each Proposal must be accompanied by a certified, bank treasurer's or cashier's check on a solvent bank or trust company, drawn to the order of the City of Philadelphia, in accordance with Clause 6, Security for Execution of Contract, of the Standard Contract Requirements. This sum is a guarantee that, if the Proposal is accepted, a contract will be entered into and its performance properly secured.

No bid will be accepted unless the standard "City of Philadelphia Questionnaire and Financial Statement for Qualifying Bidders" and the Supplemental Bidder Prequalification Documentation, with all questions fully answered, have been filed with the Water Commissioner in Room 1180, Municipal Services Building, at least sixty (60) days prior to the date of opening bids.

In regard to nondiscrimination in employment, Bidders on this work will be required to comply with the President's Executive Order 11246, as amended, and the Affirmative Action Programs/General Procedures. The requirements for Bidders and Contractors under this Executive Order and the Affirmative Action Programs/General Procedures are explained in the Contract Documents. No bid will be accepted unless it includes a complete "Affirmative Action Plan" (Philadelphia Plan) for equal employment opportunity, in accordance with the Appendix to the Proposal.

Grantees on Federally-Assisted Construction Contracts will be required to comply with the Federal Requirements and Contract Provisions for Work under the Federal Water Pollution Control Act Amendments of 1972, which are included in the Contract Documents.

Any Contract or Contracts awarded under this Invitation for Bids are expected to be funded in part by a grant from the United States Environmental Protection Agency. Neither the United States nor any of its departments, agencies or employees is or will be a party to this Invitation for Bids or any resulting contract.

The Procurement Commissioner reserves the right to reject any or all bids or to waive any informalities and to accept the bid which he deems most favorable to the interests of the City of Philadelphia, after all bids have been examined and canvassed.

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IN DEPTH
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EFT Systems? No Thanks, Not Yet

By Patrick S. Portway

IN DEPTH

ALL SAVING TRANSACTIONS MUST BE ACCOMPANIED BY PASSBOOK.
FOR WITHDRAWALS OF FIFTY DOLLARS, YOU MUST RECEIVE TWO ENVELOPES
COOL O MAT

As new technology enters the consumer marketplace, it often finds a void in regulation and consumer protection laws that do not anticipate the product or service. While this period of nonregulation affords some opportunity for innovation and experimentation, it also creates market uncertainty and the risk that consumer reaction, when it sets in, could obsolete many of the installed systems.

This is the stage of development in which we now find electronic funds transfer (EFT).

Esther Peterson, President Carter's special assistant for consumer affairs, emphasizd in a recent speech to industry, consumer and government leaders concerned with EFT [CW, Dec. 19] that "it's not too late for leaders in the financial community to listen to consumers and consumer advocates and benefit from involving consumers in the decision making, early in the process."

Peterson's own experience in the introduction of the Universal Product Code (UPC) in the food marketing industry provides an excellent analogy for what can be expected with EFT. She was consumer advisor to Giant Food Stores, a major grocery chain in the Washington, D.C., suburbs, when the firm introduced automated checkout systems based on UPC.

The consumer had for years received output from computers in the form of bills and monthly bank statements, but in UPC the computer and the consumer came face to face. The result was disastrous.

The UPC itself, now printed on nearly all prepackaged items sold in supermarkets, seemed harmless. The idea is that the code could be read automatically at the checkout station by the clerk, who would simply sweep the code block over a scanner that would identify the product, ring up the price, maintain the inventory status, order new stock as needed and print out a rather detailed list of the items included in the total price for a consumer's purchase.

Aside from the advantages to the store, the consumer would find his order checked out much quicker (although it was never clear whether the store would reduce the number of checkers to simply maintain an acceptable queuing pattern) and end up with a much more useful sales receipt.

With all these advantages, why wasn't UPC widely acclaimed by consumers? The fatal flaw in the system was the supermarket industry's attempt to reduce staff by eliminating the stamping of individual prices on each item. Instead of individual item pricing, computer-generated shelf tags carried the price.

A consumer would check the shelf tag, but, once he picked up the item and walked away, the price was not available again until it flashed at blinding speed on a computer display or appeared on the detailed cash register slip provided as a receipt after he paid for his order.

In spite of input from consumer leaders throughout the country explaining this lack of individual price marking was unacceptable, the computer industry and supermarket industry moved ahead. Their own research, prior to the installation of the system, had shown individual price marking was not important to consumers.

Consumer groups didn't agree.

In each state they sought political redress through local legislatures, and in quick succession states passed laws requiring individual price marking of grocery items.

The Retail Clerks Union was fast to back the consumer initiative and played a major role in lobbying for the legislation.

In all, 26 states either considered or passed legislation requiring individual price marking. Ironically, consumer research in test locations after installation confirmed individual price marking was indeed an issue once the consumer actually was deprived of the information.

The problems of UPC were not technical, but were "consumer acceptance" problems. As in any marketing situation, the final decision about the form of a service lies with the consumer who will use the service.

But no amount of market research could provide information on "organized" consumer reaction to UPC. Only careful consideration of input from consumer leaders who participated on UPC panels predicted what was to come.

Computerworld, in an editorial on UPC, recognizd the error of its client industry. Once burned, you would expect that the computer industry would carefully examine any new initiatives

EFT systems ultimately may be a good idea, but consumer activist Patrick S. Portway believes they have a long way to go before consumers will feel comfortable substituting them for the services they now use.

IN DEPTH

IN DEPTH

IN DEPTH

IN DEPTH

IN DEPTH

into the consumer market. But computer manufacturers are experienced in an industrial market, not the consumer market, and EFT therefore has the seeds of a second fiasco.

The National Commission on Electronic Funds Transfer, in its final report, said "the future of EFT is inextricably tied to consumer acceptance. The technology must fulfill consumer needs and, if it does not, EFT is unlikely to grow beyond its early stages."

Yet the commission membership failed to include a single recognized consumer leader. Nor, in the view of consumer activists, were the major consumer concerns adequately addressed in the final report.

The leadership of the consumer movement has rejected the commission's report as a document supporting the interests of the financial community and not, as claimed, the public interest.

The perceptions of EFT expressed by the leadership of the consumer movement will have a significant bearing on the final form of legislation regulating EFT. Although business leaders may feel consumer advocates speak for only a small, vocal part of their total market, this group will be testifying at congressional hearings, identifying concerns and preparing the arguments in favor of greater regulation of EFT.

To ignore their views is to ignore the influence groups like "Nader's Raiders," the Consumer Federation of America and some 300 local consumer groups have had in public policymaking in the last decade.

A new weight has recently been given to the views of the consumer advocates as a result of a Louis Harris poll conducted on behalf of Sentry Insurance and released in 1977. Harris found 72% of the general public, "by and large, think favorably of the leaders and spokesmen of the consumer movement and feel that consumer leaders, overall, genuinely want to help consumers."

In comparison, the same study concluded that "the gulf between the perceptions and attitudes of senior business executives and those of the public is greater and more serious and must be a cause of real concern to the thoughtful managers who are anxious to improve the public standing of business."

The leaders in the automation of the banking industry and the leaders of the technical community may scoff at the following list of consumer concerns about EFT. Indeed, Dale Reistad, president of Payment Systems, Inc., recently quipped, "The only thing consumer leaders haven't done is link EFT to cancer.'

This view notwithstanding, the commission predicted it is the consumers who will determine the final form of EFT. If the commission is right, it would be prudent for the industry to understand and address the concerns of the leaders who consumers trust.

A group of eight grass roots consumer groups under the leadership of the Virginia Citizen's Consumer Foundation (the nonprofit research arm of Virginia's statewide consumer council) has undertaken a study of consumer concerns in EFT — not to prevent the introduction of EFT, but simply to provide adequate protection of the consumer's interests and consumer education while the technology evolves. It has not yet defined which of the concerns discussed below are real, which are shared by the public at large, which issues are "soft" and easily resolved through negotiations and which are critical to consumer acceptance and the very survival of EFT.

The foundation has formed an industry advisory panel and invited executives of the financial, retail and food marketing communities to participate. Simultaneously, I've accepted a position on the American National Standards Institute's Financial Committee to represent consumer interests in industry's efforts to develop EFT standards.

If consumers are concerned, industry should be even more concerned when, for example, Citibank of New York invests millions in EFT while a Texas public referendum outlaws the use of the technology for banks. Something has to be wrong.

The report of the Privacy Protection Study Commission which preceded the report of the National Commission on EFT recognized the serious concerns of consumers about any form of computerized records about their personal lives.

Of all the issues involved in the introduction of EFT, privacy is the most emotional and should be the least controversial. Financial institutions point with pride to their efforts to preserve

(Continued on Page 16)

EFT SYSTEMS? NO THANKS . . . NOT YET

Continued from Page 15)

the privacy of their customer records. They also point out that computerized systems are less vulnerable to disclosure than paper-based check systems because fewer people have access to the data.

What concerns consumers is:

- That EFT, when used in lieu of cash, creates records of transactions where no record existed in the past.
- That EFT makes retrieval of data quicker and easier for both government agencies and for extensive in-depth market research. For example, if the data from UPC checkout systems were combined with EFT payment data, extensive market research information on buying habits could be utilized to create very valuable direct-mailing lists.

The EFT commission ignored sensitivities when it voted to recommend that banks be permitted to sell mailing lists developed from EFT systems. It further ignored trends like the legislation proposed by Illinois' Rep. Frank Annunzio, the Debt Collection Practices Act of 1977, when it recommended that address information derived from EFT systems be provided to collection agencies.

Consumer groups are not in business to protect deadbeats, but they are concerned with release of personal EFT data to third parties for any reason.

Security Questions

The public statements of banking officials about the security of EFT systems must be a constant embarrassment to the technical community. Television programs like "60 Minutes," articles in the *New Yorker* and books like *Annals of Crime: Dead Souls in the Computer* by Thomas Whiteside have made it clear that a real vulnerability exists for sophisticated computer penetration of automated banking systems.

The public realizes that current systems are probably adequate to protect the small amounts involved at an automated teller machine, etc. but if the financial communities continue to be reluctant to accept liability (the next issue) in event of a catastrophic failure, this issue will become far more important in the future. The false confidence and casual attitude displayed to a wiser public does little to build consumer confidence.

The vulnerability of the banks' wire services, which currently transmit financial transactions without encryption, is well documented. Only last summer a $2 million bogus transfer

(Continued on Page 21)

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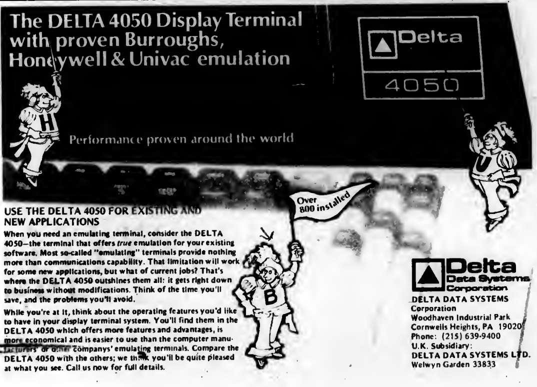

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Structured Caravan	1	$50*	5 Wash. DC 9 Toronto 11 Chi. 13 S.F. 16 L.A. 18 Houston 20 Boston 23 N.Y.		
Introduction to Techniques and Tools of Structured Systems Development	1	175	30 Chi.	22 S.F.	15 Wash. DC 20 Toronto
Managing Systems Development: A Structured Approach	2	325	31-Feb. 1 Chi.	23-24 S.F.	16-17 Wash. DC 21-22 Toronto
Structured Analysis	2	325	30-31 S.F.	6-7 Chi. 27-28 Wash. DC	6-7 Boston 13-14 L.A. 27-28 Toronto
Structured Design	3	475		1-3 S.F. 8-10 Chi.	1-3 Wash. DC 8-10 Boston 15-17 L.A. 29-31 Toronto
Structured Analysis Design Workshop	5	625	30-Feb. 3 Wash. DC	6-10 Toronto 13-17 Boston 27-Mar. 3 L.A.	6-10 S.F. 13-17 Chi. 27-31 Houston
Structured Design Programming Workshop	5	625	30-Feb. 3 Chi.	6-10 Wash. DC 27-Mar. 3 S.F.	6-10 Toronto 27-31 L.A.
Software Reliability	5	625	30-Feb. 3 L.A.	13-17 Chi. 27-Mar. 3 Toronto	6-10 Wash. DC 13-17 S.F. 27-31 Boston
Structured Programming for COBOL Programmers	2	325		23-24 Wash. DC	20-21 S.F.
Infotech/Jackson Design Technology Workshop	10	1400	16-27 Chi. ** 30-Feb. 10 S.F. **	27-Mar. 10 Houston **	6-17 L.A. ** 13-24 Boston **
Data Base and the Organization	3	475	16-18 S.F.	13-15 Wash. DC	20-22 Houston
Data Base Package Analysis & Selection	3	475	9-11 Chi. 23-25 Wash. DC	13-15 Toronto	13-15 Houston 20-22 Boston
Data Base in a Distributed Processing Environment	2	325		27-28 Boston	6-7 Chi. 20-21 S.F.
Data Base Management Systems for Minis—A Comparative Analysis	3	475			1-3 Boston 8-10 Chi. 22-24 S.F.
Systems Design in a Data Base Environment	2	325		6-7 S.F. 27-28 Chi.	27-28 Wash. DC
Designing Effective Data Bases	3	475		8-10 S.F.	1-3 Chi. 29-31 Wash. DC
Transaction Oriented Processing	2	325		27-28 Toronto	6-7 Houston 27-28 Chi.
Transaction Processing Control Systems—A Comparative Analysis	3	475			1-3 Toronto 8-10 Houston 29-31 Chi.
Data Dictionary/Directory Systems—Management Overview	1	175		24 Boston	13 N.Y. 31 Wash. DC

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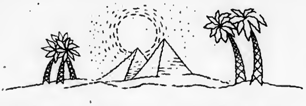

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TEXAS INSTRUMENTS.

EFT SYSTEMS? NO THANKS . . . NOT YET

Continued from Page 16)

made over the Fedwire from the West Coast to the East Coast would have succeeded save for the intervention of one human being who became suspicious and refused to release the funds.

Another example of the security problems of automated banking occurred at the Dime Savings Bank of New York several years ago — and in this case it was a clerk with no systems training who found a system flaw. The clerk, via his teller terminal, ripped off a large number of accounts for very small, unnoticed amounts, depositing them in an account of his own. The theft was discovered only by accident while he was on vacation.

The security question surrounding EFT should be openly discussed and the concerns of consumers addressed with cost effective levels of security tied to the value and frequency of funds transferred. Separate legislation addressing computer crime is one step forward, but the current standards for EFT security are inadequate.

Liability Concerns

The problems of security relate directly to the issue of liability for the unauthorized use of lost or stolen "debit cards." Federal Reserve regulations that limit consumer liability for lost or stolen credit cards also apply to debit cards which have a stated line of credit associated with them.

Pure debit cards have no stated limitation of liability and the EFT commission has recommended that the consumer have no liability at all unless he is negligent. Negligence might include such things as writing one's personal identification number (PIN) on a debit card or carrying the PIN in one's wallet.

Add to the impact of this the research done for the EFT commission in Syracuse, N.Y., that showed a large number of consumers do carry their PINs in their wallets and one begins to understand the dissenting opinion of Gordon Worley, executive vice-president of Montgomery Ward & Co., who represented retailers on the EFT commission.

Worley said, "The recommended rule of negligence permits a depository institution to escape its duty and to place the liability for loss upon the depositor.

"This recommendation would hold the consumer liable, upon showing that he was negligent, for *all* losses occurring from *unauthorized* use ... up to the total amount he has on deposit, plus $50 for any credit service activated by the debit card."

Rather than transferring the first-level security responsibility to the consumer, the financial institution should fund development of more sophisticated security systems for use with EFT such as voice or fingerprint identification systems. The bank together with the Federal Deposit Insurance Corp. must bear the liability.

Other areas of liability include the question of who pays late payment penalty charges when a bill-paying arrangement . misfires or overdraft charges when a direct deposit check is credited to the wrong account. The banks are not really sure who is liable for loss over shared wire services.

The consumer movement consensus is that applying the same limitation of liability to debit cards that now applies to credit cards — a maximum of $50 without concern for negligence — would simplify matters. Consumers recognize that for marketing purposes most banks currently assume all liability, but they are concerned that there is no written regulation and a resulting potential for catastrophic losses.

This issue of documenting proof of payment may become the pivotal one for the economic viability of EFT. If EFT systems are forced to provide "country club" billing with a paper audit trail of a slip of paper for every transaction, they may be very limited in their cost savings over the current checking system.

The Consumer Federation of America has called for the Internal Revenue Service (IRS) to accept summary EFT lists as proof of payment where other documentation does not exist — a stand that actually amounts to a pro-EFT position. Consumers, the government (IRS) and the financial community must negotiate an adequate replacement for the cancelled check or EFT will be relegated to a minor role in consumer transactions.

The issue of reversibility — of stop-

(Continued on Page 23)

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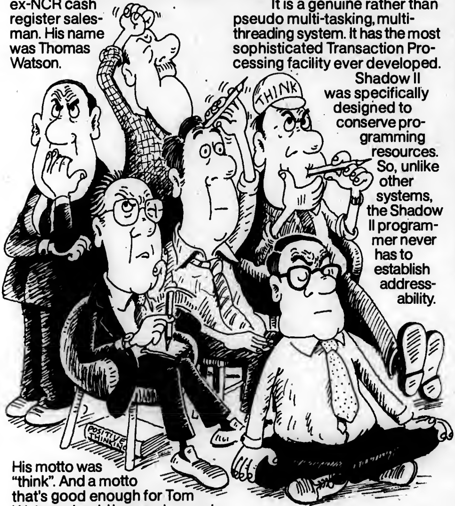

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ping payment — really comes from the inability of the banking industry to make up its mind just what EFT is. Is it a replacement for cash, as it has been described; is it simply another form of plastic, as it was described before Congress; or is it a replacement for the checking system, a position which has been used as justification for the massive EFT investment of the banking industry?

The public has been told the paper-based checking system cannot go on because the backroom operations would become so costly, as the volume of checks increases, that banks would have to begin to charge for checking services instead of operating at what they claim to be a loss. If EFT is to replace checking, which carries with it the stop payment privilege, that same privilege should be provided under any EFT system.

The infrequency with which the stop payment provision is used actually makes it a rather trivial element in the cost of current systems. Some small fraction of 1% of the checks processed each year are stopped.

It's also interesting to note that in Wisconsin, where reversibility of EFT transactions have been guaranteed by the State banking regulations for over a year and a half, not one single reversal has occurred.

The banking industry will use this data to show that reversibility is an unnecessary burden to the design of the EFT system. The view of consumer groups is that a stop payment order is often a last resort in a dispute between a consumer and a merchant.

Certainly, the more responsible retailers such as Montgomery Ward and Sears which have liberal refund policies are not the problem being addressed in the issue of reversibility. Rather, it is the small merchants, which account for the majority of disputes with consumers, and these merchants may very well participate in the future shared EFT systems.

The technical capability to reverse a transaction is inherent in most EFT systems. It is simply the reluctance of the financial community to accept this responsibility that creates or continues this as an issue.

Distributing the Benefits

As an advocate of the consumers' interests, the consumer movement has sought to negotiate the most favorable distribution of benefits resulting from EFT. Often, in the design of new automation, all benefits are designed to accrue to the industry involved, with little concern for sharing some of the savings with the consumer.

In the case of EFT, there may be no real savings to share at all. The installed systems have led to extreme costs and in many cases costly failures.

The aggressive marketing efforts of the financial community attempting to promote EFT through discounts and free services in their early stages raised the question of what will happen when the true cost of EFT must be borne by the consumer. Since the banking community acknowledges EFT systems are not currently paying for themselves, and since there's such a large capital investment involved in expanding or establishing an EFT system, the consumer movement can only assume that other charges by banks are being used to subsidize the establishment of electronic funds transfer.

Loss of Control

The Virginia Banking Association concluded from a study of consumer reaction to EFT that consumers find the debit card too easy to use. As a result, they fear they might rapidly lose track of how much they spend in any given month.

Under the checking system, on the other hand, they have had a familiar recording method to enable them to keep track of their balances.

The Float Element

Most consumers' first reaction to point-of-sales systems is to question why they would use a debit card to pay instantaneously from their savings account instead of writing a check that might take two or three days to clear and thus provide them with an element of float.

In fact, most consumers who write checks seldom use float except right before a deposit of a payroll check. One of the advantages of savings & loan and credit union EFT systems is that the funds remain on deposit earning interest until the very second they are spent.

Since few checking accounts now provide any interest for funds on deposit, checking systems offer little float advantage except, as noted, 24 to 48 hours before a paycheck is deposited.

One proposal for providing the equivalent coverage for a consumer anticipating a major deposit is to provide a temporary line of credit at a minimal interest rate to cover what in checking account parlance would be an overdraft. While not substituting for the free credit available in float, it does proivde the same service to the consumer.

The Greenwich Bank of New York has attempted to set some value on float and give the consumer something in return for the elimination of float. The Greenwich Bank will rebate to a consumer 2% against all purchases processed at point-of-sale terminals in its EFT system.

This rebate is acknowledged to be in excess of the true value of float, but it certainly represents a sharing of the advantage of EFT and the potential revenue from an EFT system with the consumer.

While some consumers may consider float a privilege, it is in fact a violation of the law in some states that prohibit the writing of a check against an account that has not yet received a deposit to cover that check. The banking industry will argue that float is really an accident of the existing system.

Float may work to the disadvantage of consumers in a broader sense by creating a false impression of what the money supply truly is at any point in time. Elimination of float through a fully implemented EFT system could give the Federal Reserve a more accurate picture of the money supply at daily closing of banks and thus may actually result in lower interest rates over an extended analysis.

Other Concerns

One problem in understanding the impact of EFT is that there are a number of economic issues that the consumer's study of EFT cannot address. Some additional in-depth studies of the economic benefit or problems created by EFT should be undertaken.

Consumer organizations are concerned that the banking community has considerable discretion in establishing cost and convenience of various forms of payment. As a result, should EFT prove to be profitable to the financial community, steps might be taken that would eventually make it the principle or only means of convenient payment.

Although the banking community has clearly stated this is not its intention, consumers fear they will have little control over the evolution of EFT. Consumer groups oppose any mandatory use of EFT even for payroll or federal payments.

And, while consumer groups are principally concerned with consumer education on EFT, the banking community has resorted to heavy promotional programs such as the free Big Mac program at the Virginia National Bank and terminals shaped like cookie jars to entice consumers into a system they clearly do not understand.

There is some concern that in the direct deposit of payroll checks some state and federal laws that protect part of a consumer's wages from garnishment will be lost. There is some question of what happens when these payroll checks are directly deposited in a bank where garnishment could occur.

Disadvantaged Consumers

Florence Rice of the Harlem Consumer Education Council has raised the question of what benefit EFT will have for the poor. EFT could bring some benefits to inner-city residents who fear robberies and therefore avoid carrying cash.

An EFT debit card and convenient

(Continued on Page 24)

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EFT SYSTEMS? NO THANKS . . . NOT YET

Continued from Page 23)

automatic tellers enable inner-city residents to draw just enough cash for a particular transaction, and point-of-sale operation enables them to make purchases without intricate check verification processes.

Some precautions to prevent intimidation of an individual at an automatic teller machine also in a high crime area should be considered. For example, customers of the EFT system could be given an emergency code they could key in on the pad to show they were under duress.

The direct deposit of welfare and Social Security checks has obvious benefits for inner-city residents. Currently little thought has been given to encouraging use of or designing services for the disadvantaged consumer.

The financial community could gain a good deal of public relations value by considering services for senior citizens, the visually handicapped and the poor.

Existing Regulations

Several state and federal laws namely the Consumer Credit Act, the Uniform Commerical Code and the Bank Secrecy Act, are in need of modification to accommodate EFT.

Since purchases handled by EFT would go through banks, the banks, under the Bank Secrecy Act, may be required to maintain excessive amounts of personal data on transactions over $100 for use by law enforcement authorities. This practice is not required for cash or credit card transactions.

As for the Commercial Credit Act and the Uniform Commercial Code, these are currently under study by private attorneys who specialize in banking, and their recommendations on consumer protection are expected soon.

Complex computer systems often take months or years before all computer hardware and software bugs are corrected and the system is error-free. In most states there are no standards for testing and certifying EFT services prior to their introduction to the public and handling of financial transactions. The Federal Deposit Insurance Corp. should certify the security of EFT systems.

Consumer Education

In his 1970 book *Future Shock*, Alvin Toffler discussed the rapid introduction of technology into society and the impact that could be anticipated as this technology altered the environment in which people would be required to function. The implications of automation in the consumer marketplace is an early manifestation of some of this future shock.

Some consumers actually fear involvement with terminals — impersonal service by machines. As a result, the most significant requirement and the issue central to the introduction of EFT, UPC or, for that matter, any increased technology in the consumer

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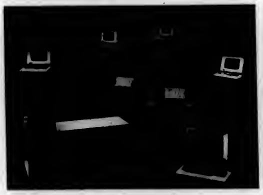

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Of course, Sycor systems also talk to each other and your smaller offices can have remote

marketplace is extensive consumer education.

While the EFT commission places this burden on industry and the financial community, it is in fact a public need that must be shared also by government and the some 300 grass roots consumer groups that exist throughout the U.S.

For government's part, the educational system of the country must incorporate an increased sensitivity to the changing consumer marketplace. How EFT operates is but one of the many issues in consumer education. It must begin in the elementary school system and continue through adult education, media and public consumer education programs.

Washington Office

The National Consumer Study of Electronic Funds Transfer opened its office in Washington, D.C. on Jan. 1 at 927 Fifteenth Street N.W. The study is headed by the Virginia Citizens Consumer Foundation in cooperation with consumer groups in eight states working on a voluntary basis.

Over the next six months, data will be collected and a consensus of consumer opinion will be developed. The information collected during this study will serve as a basis for testimony before Congress on proposed regulations of EFT.

As a starting point, the Wisconsin EFT regulations are being used as a model for state-level EFT regulations, but the study group will be recommending federal legislation.

Copies of the proceedings of the Nov. 14-15 EFT seminar at Dulles Airport are available through the national study office. A monthly newsletter, "Cabin," or "Consumer Affairs in Banking and Insurance" will follow the progress of the study and related EFT/consumer issues. It is available through the same office.

Patrick S. Portway is president of the Virginia Citizens Consumer Foundation, the nonprofit research and education arm of the 11-year old Virginia Citizens Consumer Council. The council is well-known as winner of a 1976 case in which the Supreme Court ruled advertising of prescription drugs was a First Amendment right, a decision that set a precedent for all professional advertising.

Portway is also director of the National Consumer Study of EFT and a consumer consultant to several federal agencies.

The author is employed in marketing planning by a firm that specializes in computer services. He holds a B.A. from the University of Cincinnati and an M.A. from the University of Maryland and currently is a guest lecturer at Virginia Polytechnic Institute and George Washington University.

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[illegible]
[illegible]

Editorial

A Coming Reality

Satellite Business Systems (SBS) is in the process of conducting business demonstrations at three large user sites. These demonstrations, described as strictly experimental in nature, are being held to show how business can operate with satellite-based telecommunications [CW, Dec. 26-Jan. 2].

While it is true that much of the equipment being used in Project Prelude is not yet commercially available, there is little doubt that integrated corporate telecommunications via satellite is coming.

There has been much talk recently about making telecommunications a separate corporate profit center. If this concept is to take hold, then integration of all telecommunications functions will be necessary.

As part of the SBS demonstrations, data is being transmitted at 1.544M bit/sec, and although the Harris Corp. modems were specially designed for satellite applications, the Hewlett-Packard Co. minicomputers are reportedly standard systems using standard software.

It would be a blessng for the DP/data communications user if the satelite systems of tomorrow turned out to be merely a mirror image of today's conventional terrestrial networks. It will probably not be quite that simple because of propagation delays and other unique attributes of satellite transmission, such as the broadcast mode capability.

But Project Prelude is showing management that satellites can accommodate teleconferencing, facsimile and other telecommunications methods side-by-side on a single passive airborne facility.

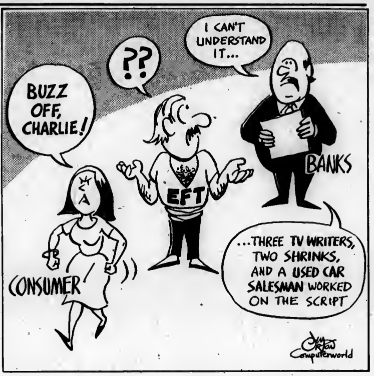
SBS hopes by 1981 to have its own "bird" instead of the experimental National Aeronautics and Space Administration satellite being used for the demonstrations. By the time SBS begins commercial service, rooftop antennas in the 12- to 14 gHz frequency range will have to be available for business users at a reasonable cost.

SBS is saying nothing about the cost of Project Prelude. Manufacturers, users and carriers have donated time and equipment to make these demonstrations a reality.

There are many questions arising from Project Prelude that remain unanswered. Can business adapt its operations to teleconferences instead of face-to-face meetings? What size user will have enough data communications volume to justify satellite facilities? How large (or small) will a user have to be to make satellites cost-effective?

The answers are emerging slowly while corporate management reorients its thinking to the methodologies suggested by satellite telecommunications. How DP and data communications will be handled in an integrated telecommunications environment, and who will be responsible for them, remains to be answered.

But satellites are coming quickly, and users should be aware of their challenging implications.


BUZZ OFF, CHARLIE!
??
I CAN'T UNDERSTAND IT...
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EFT
CONSUMER
...THREE TV WRITERS, TWO SHRINKS, AND A USED CAR SALESMAN WORKED ON THE SCRIPT
Computerworld

Letters to the Editor

Illogical Thinking by ACM, CW

The decision by the Association for Computing Machinery (ACM) to cut ties with the USSR [CW, Dec. 12] smacks of the same illogic which kept mainland China out of the United Nations for so long — "if you don't like 'em, don't talk to 'em."

I would expect this type of nonsensical, short-sighted thinking from the ACM, but hardly in a *Computerworld* editorial [Dec.19].

H.R. Sides
Surfside Beach, S.C.

Tragedy or Comedy? Neither

Alan Gotthelf's response "Tragedy or Comedy?, CW, Dec. 19] to the Nov. 28 article on Riverbend Farms leaves me a bit perplexed, for the implications he draws suggest some confusion. Please permit me a few words of clarification.

From the time Riverbend Farms installed its IBM System 32 to the present, the company has grown 10 times in size. Our growth was partly made possible by using the computer and our conversion to DP was not, as Gotthelf implies, an unplanned and naive adventure in which delusion was perpetrated by IBM.

The conversion process was carefully devised and designed in incremental stages. We phased in one business application with a computer size we thought to be appropriate and developed our data base in a methodical way while, at the same time, expanding the capabilities of the hardware to match our work load. Our order for the System 34 was a logical extension of this incremental plan.

I hasten to add that in his analysis, Gotthelf did focus upon a small inaccuracy. The printing speed of our System 32 is now 2[illegible]5 line/min, but since this upgrade took place after the article was written, the inaccuracy is excusable.

Riverbend Farms' conversion is not the "comedy or tragedy" to which Gotthelf alludes, but rather, it is an ongoing process of development and experimentation.

Larry R. Harris
President
Riverbend Farms, Inc.
Sanger, Calif.

No More Put-Downs, Please

I am greatly aggravated and disturbed about an article that was recently put on the bulletin board in my company's lunchroom. It is entitled "Operators — We Hear You." [CW, Dec. 5].

I agree with the article until the first sentence of the third paragraph. The sentence reads "... manager has called operators 'little more than glorified secretaries.' " What does that make a secretary? As a secretary, I resent that statement and feel it was a direct slur against me and my coworkers.

I am not saying that secretaries are better than operators, but we certainly aren't inferior. As it is, secretaries are put down enough in the business world. Secretaries and operators are less than appreciated verbally or salary-wise.

Leslie Rogers
Cupertino Calif.

On Employee Responsibility

I greatly enjoyed Jack Stone's column in the Nov. 28 issue of *Computerworld* and his accurate description of the professional's responsibility to his employer.

It was all the more enjoyable when I read, at the bottom of the following article, Alan Taylor's waiver of his publisher's copyright on that article, encouraging his readers to "reprint and distribute" freely.

John F. Sheeran
Boston, Mass.

Data Past

Five Years Ago
Jan. 10, 1973

SACRAMENTO, Calif. — A $1,200 investment in plastic covers protected about $15 million worth of computer equipment during a fire that ravaged the state headquarters of the California National Guard here. The plastic covers prevented water damage. The equipment was up and fully operational within four days after the effort to preserve the files.

— — —

WARWICK, R.I. — The city's DP director accused IBM of using "the resources available to the bureaucratic structure of a large corporation" in an attempt to dissuade a user from moving to another vendor. In a letter submitted after it became known the city was contemplating switching mainframers, IBM implied local DP personnel were not competent to decide on hardware selection, DP director George Waterman said.

Eight Years Ago
Jan. 14, 1970

MONTVALE, N.J. — Dr. Richard I. Tanaka, president of the American Federation of Information Processing Societies (Afips), announced future Joint Computer Conferences would be held "to a maximum of 1,000 booths." Tanaka also announced an increase in conferences registration from $30 to $40, although fees for members of Afips constituent societies would remain at $20.

— — —

MAYNARD, Mass. — Digital Equipment Corp. introduced the 16-bit PDP-11, which featured a high-speed bidirectional data path called "Un[illegible] that it said was immune to technological obsolescence.

Professional Deprivation Tied to DP Crime?

By Jack Stone
Special to CW

The Human Connection

When John O'Mara, executive director of the Computer Security Institute (Northboro, Mass.) first phoned me in late 1975, I rather suspected what was on his mind.

"Jack," he said when we met a short while later, "we in the computer security business have an important problem we are simply not addressing."

"John, I really know what you're going to say," I replied. "It's on everybody's mind and nobody's doing anything about it. The issue is the 'disgruntled' employee — Is he a serious security risk and, if so, how do you detect and manage such a person?"

"Precisely!" John replied.

This conversation ultimately led to my lecture before the institute's Fourth Annual Computer Security Conference this past November, titled "How to Recognize and Control the Disgruntled Employee." The material for the talk was derived from my own research and study plus the experience of being a disgruntled employee for years before finding happiness in my own DP management consulting business. I thought it would be useful to devote this column to some of the thoughts I expressed at the conference.

To begin with, let me narrow the scope of the subject. I use the term "disgruntlement" to mean discontentment associated with the business organization. There are, of course, abnormal employee behaviors related to medical, psychological and sociological problems, but these will be subjects of discussion on other occasions.

Consider a working environment where there is an atmosphere of strong disgruntlement involving a relatively large number of highly creative employees who are closely tied into informal work groups (does this description fit your DP department?). Unfortunately, there are few facts on which to base a scientific conclusion regarding a correlation between this type of situation and the potential risk to computer security. But common sense forces one to conclude that such an atmosphere just has to increase the opportunities for mischief, vandalism, embezzlement, mayhem or even more serious criminal actions.

I'm sure you know that criminal psychologists tend to relate conventional crime to socio-economic deprivation. I'm suggesting, by analog, that there may be a relationship between professional deprivation and the potential for "white-collar" crime in the DP department.

Although I sense glimmerings of increasing DP management awareness of personnel problems, the distressing truth of the matter is that many DP centers simply ignore the risk of security violations from their own staffs. It would seem prudent for DP managers to reallocate some resources toward the correction of obvious deficiencies in the personnel area rather than dump it all into physical and data set security.

It has been suggested that in order to find future troublemakers, a manager should look for those employees who exhibit somewhat abnormal behaviors. But who's to say what is normal or abnormal behavior, particularly in our line of work? These two states are relative concepts, rather arbitrary points on the behavior continuum. Both are shaped by the same processes and principles involved with mental development.

Further, similar influences over the years result in abnormal habits and attitudes in some and not others. In addition, abnormal behavior in one person may change to normal (and vice versa for another) depending on the mental make-up of the individual, his perception of the environment and whether his mental state allows him to determine that positive reinforcement (the psychologist's jargon for "happiness") can be obtained by changing his behavior.

Is there a rational set of principles that can be used to assess, forecast and control employee behavior in a scientific kind of way? 'Fraid not. Human nature is too varied, if not unruly, to respond to formula treatments. Each person has a unique set of personality patterns. What the manager constructs as positive reinforcement for one, may be perceived quite the opposite for another.

Responses Vary

And behavioral responses change all over the map as a complex function of individual, group and societal relationships. (Astrologers go even further — they rely on intergalactic relations.) The situation is again complicated by many employees who are more adept at changing the behavior of the manager than the other way around.

And then managers have to face the particularly insidious case of the apparently loyal, normally behaving, hard-working, well-paid, pleasant-mannered DP employee who this very minute is, in fact, plotting an illegal act against the company.

Stone will continue this discussion in next week's column.

Output Has Flaws in Dating, Completeness

The Taylor Report
By Alan Taylor CDP

Last week's column must have struck many readers as being incomplete. It dealt with one of Saks Fifth Avenue's so-called H3 accounts, but never said whether Saks was really owed any money. Further, the column didn't present Gerald Clarke's opinions about the matter.

These omissions were intentional. The actual story of Clark's account over the years struck me as potentially prejudicing the consideration of the basic computer user problem — reckless and incorrect production of computer output.

Therefore, I dropped some of the facts from that article so readers could first react *without* knowing the background.

However, by the time you read this, the original questionnaires will be coming in, so here is a full explanation.

Clarke's Complaint

Along with the Federal Trade Commission (FTC) and the Massachusetts Attorney General's office, I received a copy of Clarke's complaint about Saks' $57 statement, which was shown last week. The complaint was based upon what Clarke saw as being deliberate system design and mailing practices. The bill, although dated Oct. 5, had not been mailed until Nov. 18. Clarke thought this was deliberate.

And Saks had managed to "lose" two previous credits to him amounting to $77. Clarke believed this had been straightened out, but now that they were "lost" again, he came to believe it was deliberate. He particularly remembered there had been FTC proceedings earlier against Saks for "losing" credit balances in the system. They had ended a couple of years ago in a consent decree.

Saks' Response

The story from Saks' end, as given by Vice-President William Bloom, was very different. Bloom agreed that there had been two "credits" at one time, and the invoice had been mailed after the printed due date. But he said this showed that the computer system was working — not that it had failed.

According to Bloom, the only real outstanding credit, for some $50, had occurred some years ago, before 1972. The FTC people had agreed that Saks need do nothing about that credit or any others like it. So Saks had done nothing about it, simply putting it into microfilm or some other archive form, and keeping the H3 flag on the account.

The other Clarke credit that Bloom did not agree should be in Clarke's account was a $27.79 credit caught by the FTC consent decree. Bloom said a nontransferable, numbered credit memorandum had been sent out by Saks around Sept. 8, 1975 and had not been returned by the post office.

Therefore, Bloom said, there was no credit due in the account for this, even though there was no history of its ever having been accepted by Clarke or used in any way.

The Saks system output was ambiguous. Clarke said he had no recollection of receiving the credit memorandum. A typewritten statement issued in January 1974 (well inside the FTC period) acknowledged the debt of $77.79, but within the year all that had vanished; in early 1975 the 'Previous Balance' was listed as zero. The $27.79 was found in May 1975, but the $50, as far as I can see, was just left lost from 1974 on.

As for the mailing, there was no "printing date" on the output, no statement that it was for research but not mailing purposes and, no statement of delayed mailing. Clarke only had the postmark to go

(Continued on Page 30)

Any Suggestions?

Saks thinks its system design is correct, but while it may not directly infringe any ICCP code at this time with regard to output dating or system completeness, these points should be addressed.

1. Is there any way in which Saks could now — or in the future — correctly date computer output, so that output recipients can know the production date instead of just the cycle cut-off date? ____________________

____

If there is a way, would it be important to use in this type of situation? ____________________

2. When a system produces a "balance" figure, is there any way in which the consumer can be told it is complete, or, if not, exactly what information has been ignored in its compilation? ____________________

____

If there is a way of doing this, would it be important to use in this type of situation?

____

Please return the completed form to Alan Taylor, c/o Computerworld, 797 Washington St., Newton, Mass. 02160. Thank you.

Name ____________________ **Professional Position** ____________________

Street Address ____________________

City and State ____________________

Professional Society Memberships, Qualifications ____________________

Letters to the Editor

City Learned Lesson In Hard-Sell Tactics

The article entitled "Favoritism Charges Shake City CPU Selection" [CW, Dec. 19] really came home to the City of Edmond. The city recently advertised for an in-house system to replace the computer service presently provided by the local university. The major point stressed in the specifications was the ability of the system to expand without major reprogramming efforts.

Nine major manufacturers replied. The list was subsequently narrowed to three: Burroughs Corp., Honeywell Information Systems and Univac.

IBM had proposed a System 32, later changed to a System 34. This proposal was rejected on two counts: (1) the need for a double conversion (once the current service to the IBM 32 and then to the IBM 34); and (2) the IBM 34, as proposed, lacked the growth capabilities the city needed.

The city staff really learned a lesson in "hard-sell tactics" the few days following the announcement of the three finalists still under consideration. The IBM representatives immediately moved up the city organization in an attempt to overturn the decision.

A letter was eventually sent to the Oklahoma City IBM office stating the city's offical position on the selection process. A final attempt was still made to influence the city's decision in favor of IBM, and it took some strong verbal effort on my part to remove its representatives from my office.

Some months later we heard rumors to the effect that the local IBM office had placed an order to the production division for an IBM 34 using Edmond as the purchaser, based on our initial request for proposal.

This was the city's first experience with attempting to purchase computer equipment and we have since learned that our experiences were not unique and that such sales tactics are not confined solely to IBM. I find it sad that the major U.S. corporations would sacrifice the needs of the country's citizens on the altar of a sales chart.

Bill Dashner
City Manager
Edmond, Okla.

'Due to Computer Error You Have No Check This Payday, But Here Is Your Government Bond . . . You Won't Be Able to Cash It for Two Months, of Course.'

Taken Out of Context

I have just read the article concerning the favoritism by the Mayor's Advisory Committee for the City of Knoxville [CW, Dec. 19]. The article was entirely out of context and did not truly reflect the purpose and intent of the committee.

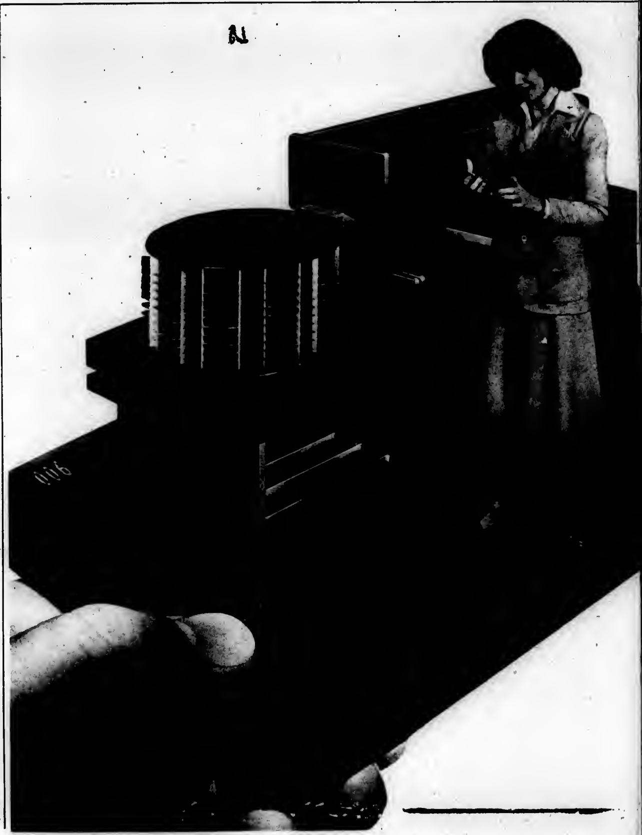
The meeting discussed in the article was only one of several held by the committee, and the thrust of our exploration was toward a "two-year window" for a possible merger of the city/-county DP departments.

At no time was the committee acting in judgment upon James Ryan's selection of hardware. We did feel that the request for proposal was premature, inasmuch as there was an existing installment contract with Honeywell Information Systems for Knoxville's present 437.

Contrary to Ryan's feeling that the committee was trying to block the Burroughs system, this was not the intent at all. We were asked by the city council and the mayor to review Ryan's procurement procedures. I think that his comment stating that there had been an attempt to resolve the contract dispute between HIS and the City of Knoxville is less than candid. HIS did make several overtures.

For your information, on Dec. 13, the mayor's advisory committee recommended, and it was ap-

(Continued on Poge 29)



Letters to the Editor

(Continued from Poge 28)

proved by city council, that the city remain with HIS in an upgraded mode and that contrary to these "alleged tapes," at no time was the committee pro-IBM.

T.J. Kennedy Jr.
President
Knoxville Computer Center
Knoxville, Tenn.

Why No Reaction?

As the national coordinator for the Data Processing Management Association's (DPMA) Industry and Government Relations Sales Tax Subcommittee, I have been watching with interest (and in many cases disbelief) the reaction of the entire DP industry to the events that have taken place in 1976 and 1977.

We have witnessed several incredible events that would have sent shockwaves through any other profession but were accepted with little outward reaction (except for a few laymen and lawyers close to the specific issue). Just think for a moment what has happened and its implications:

1. Robert Sherin has proved that there is legal recourse for laymen by which speedy remedy can be achieved without many of the time-consuming encumbrances of the normal judicial procedures. Yes, our legal system does work for the benefit of the common man.

2. The "Mom and Pop DP shop" as well as the large institutional data centers have representation and the backing of 23,000 DP professionals through DPMA International in standing up and questioning sales tax assessments against them; one letter or phone call to their legislative network representative gives them access to our subcommittee members.

3. Successful efforts have already been concluded in Florida, Alabama and New York in defeating current sales tax regulations and in some cases having new regulations or legislation implemented protecting DP interests. Several vendors are already sending notices to customers informing them that sales tax rebates are soon to be given to them amounting to thousands of dollars.

4. Other states have seen the events in other states and are already interpreting their regulations in terms favorable to the industry, thereby avoiding costly and time-consuming judicial proceedings.

5. Tennessee is a case unto itself; further activities and appeals will be forthcoming and it would not serve to comment on the issues at this time. DPMA is watching events closely and is providing support for Sherin's efforts.

But these are events of the past and present. What of the future? DPMA has already approved funding for 1978 activities of the sales tax subcommittee. We are already planning to continue our support in the Tennessee appeal, but we are also reviewing past events and decisions in Texas and Wisconsin, which we believe to be key states since they are representative of specific issues that must be addressed.

One of the major ingredients necessary to make 1978 an eventful year, and a year which will be remembered as the major turning point in the sales tax issue, will be involvement of all data processors.

It is our responsibility to ourselves and our employers to understand the issue and follow the events closely. You should know who your DPMA state legislative network representative is and how to inform him of any activity in your state's sales tax commission assessments.

Steve Vajda
Miami, Fla.

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'Simple Mathematical Procedure'

How to Project CPU Life? Try This Formula

By Fred Springer-Miller
Special to CW

"What is the projected life of this CPU?" is a question frequently asked by DP and corporate management. A simple mathematical procedure can help fix the number in spite of all the variables that surround it.

CPU	POWER	10%	15%	20%	25%	30%	35%	40%	45%
3138	0.28	-13.3	-9.1	-7.0	-5.7	-4.8	-4.2	-3.8	-3.4
3145	0.43	-8.9	-6.1	-4.7	-3.8	-3.2	-2.8	-2.5	-2.3
3148	0.53	-6.7	-4.6	-3.5	-2.9	-2.4	-2.1	-1.9	-1.7
3155	0.79	-2.5	-1.7	-1.3	-1.1	-0.9	-0.8	-0.7	-0.6
3158-1	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3158-3	1.12	1.2	0.8	0.6	0.5	0.4	0.4	0.3	0.3
3031	1.36	3.2	2.2	1.7	1.4	1.2	1.0	0.9	0.6
3158-1AP	1.65	5.3	3.6	2.8	2.2	1.9	1.7	1.5	1.4
3158-1MP	1.65	5.3	3.6	2.8	2.2	1.9	1.7	1.5	1.4
3158-3AP	1.85	6.5	4.4	3.4	2.8	2.4	2.1	1.8	1.7
3158-3MP	1.85	6.5	4.4	3.4	2.8	2.4	2.1	1.8	1.7
3165	2.22	8.4	5.7	4.4	3.6	3.0	2.7	2.4	2.2
3168-1	2.72	10.5	7.2	5.5	4.5	3.8	3.3	3.0	2.7
3168-3	3.09	11.8	8.1	8.2	5.1	4.3	3.8	3.4	3.0
3032	3.09	11.8	8.1	6.2	5.1	4.3	3.8	3.4	3.0
3033	5.56	18.0	12.3	9.4	7.7	6.5	5.7	5.1	4.6

These tables are intended as a guide to CPU life based upon estimates of annual increases in CPU load and as an adjunct to — but not as a substitute for — comprehensive system analysis. Table 1 (above) is based upon an IBM Model 3158-1 CPU configuration; Table 2 (below) is based upon the maximum expanded configuration of a Model 3158-3AP CPU.

CPU	POWER	10%	15%	20%	25%	30%	35%	40%	45%
3138	0.15	-19.8	-13.5	-10.3	-6.4	-7.2	-6.3	-5.6	-5.1
3145	0.23	-15.4	-10.5	-8.0	-6.6	-5.6	-4.9	-4.4	-3.9
3148	0.29	-13.2	-9.0	-8.9	-5.6	-4.8	-4.2	-3.7	-3.4
3155	0.43	-9.0	-6.1	-4.7	-3.8	-3.3	-2.9	-2.5	-2.3
3158-1	0.54	-6.5	-4.4	-3.4	-2.6	-2.3	-2.0	-1.8	-1.7
3158-3	0.61	-5.2	-3.6	-2.7	-2.2	-1.9	-1.7	-1.5	-1.3
3031	0.73	-3.2	-2.2	-1.7	-1.4	-1.2	-1.0	-0.9	-0.8
3158-1AP	0.89	-1.2	-0.8	-0.8	-0.5	-0.4	-0.4	-0.3	-0.3
3158-1MP	0.89	-1.2	-0.8	-0.6	-0.5	-0.4	-0.4	-0.3	-0.3
3158-3AP	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3158-3MP	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3165	1.20	1.9	1.3	1.0	0.8	0.7	0.6	0.5	0.5
3168-1	1.47	4.0	2.8	2.1	1.7	1.5	1.3	1.1	1.0
3168-3	1.67	5.4	3.7	2.8	2.3	2.0	1.7	1.5	1.4
3032	1.67	5.4	3.7	2.8	2.3	2.0	1.7	1.5	1.4
3033	3.01	11.5	7.9	6.0	4.9	4.2	3.7	3.3	3.0

Reader Commentary

The starting point is a table of relative CPU power, such as that published in *Computerworld* after the IBM 3031 and 3032 announcement. Such a table must, of course, reflect the types and mix of processing done by a particular CPU (commercial, scientific, schoolboy Fortran, etc.). It may then be scaled to make the pertinent CPU its base.

The second vector in the equation is a range of percentages — expressed as factors — of projected annual increase in CPU utilization. For batch systems, this may depend simply upon new applications, real-time systems, time-sharing, etc., and may well have to be based upon prime-time rather than 24-hour utilization.

The illustrations shown here were prepared for an installation planning to upgrade its saturated IBM 3158-1 CPU to an attached processor (AP) version, then to a Model 3.

The first table shows the relative power of the current CPU as unity, because it is assumed to be exactly equal to the workload; its life, for whatever increase in CPU load, is of course 0.

From the 30% column for example, we see that at this growth rate a 3158-3AP should provide 2.4 years' additional service. The negative numbers project life into the past; at 30% growth, therefore, a 3145 should have died 3.2 years ago.

The second table shows the 3158-3AP scaled down to 1 in power and attempts to answer the question, "When it runs out of steam, what then?" We see a 3032 replacement would last only two years or so, a 3033 more than four — data that funds an analysis of what lease period for a 3032 (if any) should precede purchase of a 3033 for maximum economy over an extended time span.

Such an analysis can prove far more complicated for a manufacturing concern dependent upon short- and long-term bank loans, bonds and debentures for working capital than for an insurance company with a relatively assured cash flow and rate of return after taxes. In either case, however, for whatever sort of net present value calculation we contemplate, the base data is essential.

The computation is simple and consists of taking the logarithm of each relative power to the base of the increase factor. With APL, the entire table of life expectancies can be generated by a single instruction. If A is a vector of relative CPU power such that one element in A has the value of 1 arbitrarily, then the instruction

1 — B • , ⍟ A

displays the entire table rounded to one decimal place. It isn't that simple without APL.

An advantage of this sort of presentation is that it allows — perhaps even forces — management to participate in the evaluation of CPU utilization growth, upon which the validity of the exercise depends.

A disadvantage is that explicit figures, no matter how hedged or qualified, provide the fasteners with which accountants and comptrollers (and others unaccustomed to a world where nothing ever balances) can nail you to the wall.

Along this line, if anybody has a formula for predicting CPU resale values after X years, I should certainly like to hear about it.

Springer-Miller is an assistant for planning and research for AIG Data Center, Inc., a service company specializing in insurance.

Output Flawed in Dating, Completeness

(Continued from Page 27)

on and that cannot be regarded as proof.

The numbered nontransferable certificate had apparently never been tied into the system at all, although it was certainly part of Clarke's account history with Saks. Bloom said that to find out whether it had been cashed would take weeks, and I have no reason to disbelieve him.

All of this is very regrettable but reflects no systems problems, according to Saks. The store is putting the matter straight so far as Clarke is concerned.

Yet, I see some general systems problems here which our profession — including the Institute for the Certification of Computer Professionals (ICCP) — has simply not addressed:

1) Is there any way in which the actual printing can be accurately dated? In the same way that cities and towns check on the accuracy of weighing machines in the supermarkets, at some time it may become necessary for data processors to actually date the printing, as opposed to the processing, of a run.

Technically, we just don't have the tools to do it yet. It would require special equipment (perhaps a national digital time service) and a special feature in languages such as Cobol "Actual Printing Time." Tests would have to be made to determine whether the output was being physically printed and not just spooled during a particular run.

Printing time *could* be indicated, but Saks cannot be faulted in 1978 for not going beyond normal technology. (It is, of course, possible to fault anyone who uses a system that requires more than standard technology, but that is another matter.)

2) Is there any way to see that reports are complete?

The idea of a nontransferable credit not being part of the statement — and not being recorded within relatively easy access — does not fit my conception of a complete system. The credit memo had plenty of cross-references on account number, etc. Yet it wasn't effectively entered into the system. Should it have been?

Well, those are the questions I can see coming to the profession as a result of the Saks affair. Again, I'd like to know your thoughts on these matters; then we can put the matter of the Saks H3 accounts to rest.

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Study Finds Users Sticking to OS/360

By Don Leavitt
CW Staff

WALTHAM, Mass. — Despite IBM's final downgrading of support for OS/360 from Class A to Class C last year, users aren't in the middle of a mass migration away from the operating system that developed over a period of 11 years.

Results of a study made late last year by the Services and Software Information (SASI) program of International Data Corp. (IDC) indicated that there were 530 sites with IBM 360s operating under "plain vanilla OS" at year-end 1976 and that the figure would grow to 575 sites by year-end 1978.

IDC also found 680 IBM 370 installations were running under OS/360 at year-end 1976. That figure will probably drop to 410 by the end of this year, according to SASI director Nancy Scull, who sees that change reflecting a changeover to the VS environment.

The 360 figures indicate users committed to OS/360 will remain so commited, she said, whereas the increase over the year-ago figure represents DOS installations that are moving or have moved to OS/360.

The increase in OS users on 360 equipment runs directly counter to the change in size of the installed 360 base as seen by IDC. The research firm sees the base shrinking from a grand total of 2,120 360/40s, 50s and 65s at the end of 1976 to only 1,760 of the same CPUs by the end of this year.

The change from Class A to Class C support applies to OS/360 users operating under either multiprogramming with a fixed number of tasks (MFT) or multiprogramming with a variable number of tasks (MVT). The change took place for OS Release 21.0, 21.6 and 21.7 last May and for Release 21.8 at the end of November.

MFT and MVT were first delivered by IBM in 1966 and 1967. Used on the larger IBM 360s and the nonvirtual 370s, they were transformed into OS/VS1 and OS/VS2, respectively, when they were rewritten for virtual 370s.

The change came as no surprise to users. When IBM delivered Release 21.8 in 1974, it had warned users it was the end of the line for OS/360.

Under IBM terminology, Class A support includes centralized programming effort for both enhancements and error corrections and, if needed, free on-site personnel to solve a problem traceable to the IBM software. Class C status rules out all free support, but programming and systems engineering services are available on a fee basis.

If modifications are already available for a problem just discovered by a user, the coding change will usually be provided without cost, even under Class C.

In addition, user groups such as Share and Guide have accumulated substantial libraries of OS changes that are available to their members at little or no cost.

The IDC study indicated a number of installations with both 360s and 370s have in fact already replaced IBM-supplied operating system software with offerings from outside firms, including, for example, Extended DOS from the Computer Software Co., DOS/MVT from Software Pursuits and DOS/RS from Dearborn Computing Leasing Co.

IDC is at 214 Third Ave., Waltham, Mass. 01254.

Meet Open To CPE Fans

NEW ORLEANS — Anyone interested in computer performance evaluation (CPE) is welcome at the next meeting of the Southwest Computer Measurement Group, scheduled for Jan. 19-20 at the downtown Holiday Inn here, according to program chairman Gary Goodwin.

Topics to be covered in the meeting, which will be held Thursday evening and all day Friday, will include IBM's Information Management System (IMS), IBM's 3850 mass storage system and MVS tuning. Goodwin said he would like to hear from anyone planning to attend so that seating and meals can be arranged. He is at Boole & Babbage, Inc., Suite 901, Stemmons Tower West, Dallas, Texas 75207.

Version 2 Supports 32 Users

DEC Upgrades IAS for PDP-11s

MAYNARD, Mass. — Digital Equipment Corp. has enhanced its Interactive Application System (IAS) operating software for large PDP-11 configurations. IAS Version 2 is said to support more users with more peripherals and more software options than the initial release.

IAS is a general-purpose, multifunction operating system that enables simultaneous execution of real-time, batch and interactive programs on PDP-11/45s and 11/70s. The first version could handle 20 interactive users, DEC noted.

IAS Version 2 was designed to include support for the PDP-11/60 as well and to allow as many as 32 interactive users to function concurrently, according to a spokesman. The updated software also supports RPO5 and RPO6 disk storage subsystems, the RXO1 floppy disk subsystem and the LA180 matrix line printer, he said.

The multilanguage operating system now offers facilities for users of RPG-II and Coral-66, a real-time language developed in the UK, as well as continuing support for Basic-11, Cobol, Fortran IV, Fortran IV Plus and a macro assembler, the spokesman continued.

Data services reportedly available under IAS Version 2 include Sort-11; DBMS-11. — based on Cullinane's IDMS data base management system; Datatrieve-11, a conversational query language and report writing system; and the multikeyed Isam capability of Record Management Services, RMS-11.

The system provides multitasking and subtasking capabilities for time-sharing users and full support for execution of real-time and time-sharing tasks in the same partition, DEC said. More communications flexibility, system utilities and compatibility with more laboratory and industrial real-time interfaces are also part of IAS Version 2, the spokesman added.

The enhanced software is available for distribution to current PDP-11 installations or for delivery with new 11/45s, 60s and 70s. The single-system license fee, with full support, is $17,160.

Softool Checker Documents Errors in Fortran Programs

GOLETA, Calif. — The Ansi Fortran Checker from Softool Corp. analyzes Fortran programs for compliance with the 1966 American National Standards Institute (Ansi) definition of the language. Violations of the standard are concisely documented, according to a spokesman.

The package includes an "elaborate" diagnostic capability which is superior to that of most existing Fortran compilers, the spokesman claimed. This capability means the software is also an error detector which documents existing as well as potential errors, he said.

The checker produces clear and self-documenting messages, in the spokesman's opinion, but a user manual is provided. The software is written in a subset of ANS Fortran so it can be used on virtually any CPU, he added.

A permanent license, including the first year of maintenance, costs $8,000, Softool said from 340 S. Kellogg Ave., Goleta, Calif. 93017.

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Workshops Set

NEW YORK — "Jackson Design Method" Workshops providing lectures and time for application of structured programming tools and techniques will be sponsored by Structured Methods, Inc. (SMI) starting next week (Jan. 16) in Chicago and on Jan. 30 in San Francisco.

The two-week courses will be presented by David King and others from Infotech International, the U.S. affiliate of Infotech Information Ltd., which has conducted conferences in the UK featuring Michael Jackson himself, SMI said.

The individual registration fee for either workshop is $1,400, SMI said from 133 E. 58th St., New York, N.Y. 10022.

'Commercial' Fortran Supports HP Sites

LONG BEACH, Calif. — A commercially oriented Fortran IV compiler, described as the first of several elements of a complete commercial software support system to be offered by Data Systems for Industry for the Hewlett-Packard 21MX and 1000 minicomputer line, is now available, according to a spokesman.

The compiler is said to include a highly optimized PRINT statement that eliminates the need for FORMAT statements and the report generation problem associated with the usual WRITE/FORMAT combinations.

Also provided in the compiler is an enhanced DATA STATEMENT definition providing variable-length character strings in A1, A2 and A3 ("crammed") formats.

Double integer arithmetic is fully integrated, which satisfies values in excess of two billion rather than the 32,767 maximum supported by single-integer processing.

The compiler requires a minimum user area of 10K words and generates relocatable code which runs under HP's DOS-M, DOS-II and RTE environments.

Relocatable code for the compiler and the run-time modules costs $4,800 plus $30/mo. Optionally, an additional $10/mo provides maintenance and update support and reference manuals are available for $25 apiece.

Data Systems for Industry is at 3450 E. Spring St., Long Beach, Calif. 90806.

DP Audit Tools Described

WELLESLEY, Mass. — Three certified public accountants have written a 512-page book, *Computer Control & Audit*, as an authoritative guide to the tools and techniques for control and audit of computer-based systems and their operation, according to the publisher, QED Information Sciences, Inc.

The impact of DP on auditing has created a need to strengthen current knowledge of these tools and techniques within both the DP and the auditing community, a spokesman said, noting that authors William C. Mair, Donald R. Wood and Keagle W. Davis are all partners in Touche Ross & Co.

The system development process as well as the logic of the application programs themselves are covered in the book. So are the control and audit implications for advanced topics such as on-line systems, QED added.

Written under the auspices of the Institute of Internal Auditors, *Computer Control & Audit* costs $29.50 ($25.50 prepaid) plus $1.50 for postage and handling and can be ordered from QED, P.O. Box 181, 141 Linden St., Wellesley, Mass. 02181.

'HOP2' Service Aids Hospitals

BURLINGTON, Vt. — An open-item billing and accounts receivable service for hospital outpatient departments, HOP2 from BDP, Inc. keeps accounts on file from admission to admission to improve financial control, according to a spokesman.

The service is batch-oriented, working with diskettes of patient transactions sent to the company's DP center here. It produces insurance claim forms, when appropriate, and statements to patients that show what is owed beyond any insurance claim.

BDP charges a start-up fee of $1,000 plus travel to put HOP2 into a hospital, then production fees tied to number of transactions, accounts on file, statements and insurance claims generated.

BDP, Inc. is at 164 College St., Burlington, Vt. 05401.

T-BAR 4x12 Channel/Peripheral Switch Installation

For more efficient use of peripherals

T-BAR's 3915/3916 matrix switches for use with ITEL, AMDAHL and IBM 360/370 type computers permit load balancing by sharing printers, tape drives, discs and front ends between CPU's. Greater configuration flexibility is attained by using the larger T-BAR matrix sizes — up to 12 computer channels and 12 strings of up to 4 peripherals each — 12x12.

The 3915/16 computer switch speeds system restoral when mainframe trouble occurs. Pushing a button interchanges peripherals between a failed and back up system or reconfigures a computer room for multiple tasks on the same mainframe.

The switch can be controlled from a centralized operator's position up to 200 ft. away.

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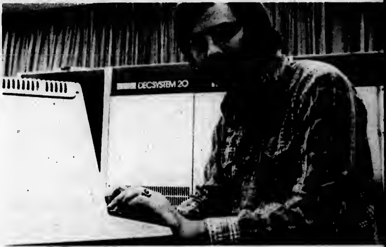

James E. Dunn, Manager of Computer Services, Linkabit Corporation, San Diego, California.

Software. "At Linkabit, we develop and produce advanced error control equipment, satellite communications modems, and data compression techniques for NASA, Department of Defense agencies and several commercial customers. For us, one of the key software features of the DECSYSTEM-20 is the optional DBMS software package which interfaces with both COBOL and FORTRAN. It lets us combine both scientific and commercial files into one powerful data base. A data base that's readily accessible, easily defined and maintained.

"The result is more accurate and timely reporting of job status, parts availability and manpower utilization."

Expandability. "Leasing is a dynamic business. So when Manufacturers Hanover Leasing went into the market for a computer system, we wanted one that could handle all our anticipated needs, as well as our present client load.

"That's why we went with the DECSYSTEM-20.

"We run heavy CPU calculations for financial models and the DECSYSTEM-20 offers us easy expandability — from its central processor and main memory all the way to the number of terminals. Furthermore, the DECSYSTEM-20 will continue to grow at the same rate we will — which means we'll never stretch the system beyond its capability or have a bigger system than we need.

"Finally, we really liked the fact that programs and

Lawrence M. Pinsky, Director of Information Services, Manufacturers Hanover Leasing Corp., New York, New York.

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procedures developed now for the computer will still be completely workable in any expanded system. And, at the same time, our productivity will increase at moderate cost."

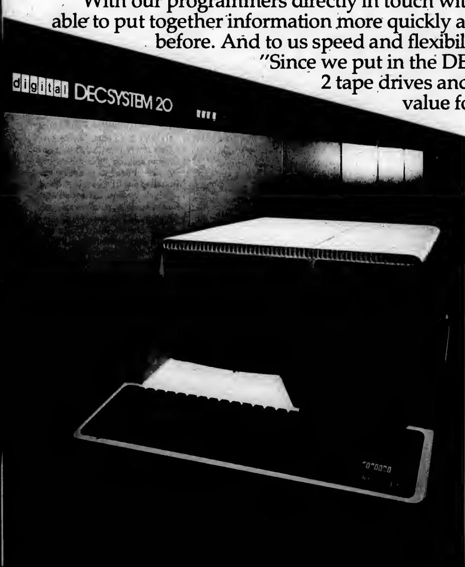
Productivity. "As the corporate headquarters for 120 reporting units involved in chemicals, natural resources and consumer services all over the world, we process a massive amount of information. And it's used by all kinds of analysts and decision makers.

Robert E. Herlihy, Director of Computer Technology and Operations, W. R. Grace & Co., New York, New York.

"Switching to an interactive system is giving us the increased productivity we were looking for. We already see this in our programming and we expect to see this soon in our user community.

"With our programmers directly in touch with the interactive computer, we're able to put together information more quickly and in ways we couldn't before. And to us speed and flexibility are crucial.

"Since we put in the DECSYSTEM-2050 with five discs, 2 tape drives and 384K of core, we're getting more value for our dollar."



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'Best/1' Runs Interactive Models

LINCOLN, Mass.— The heart of the Best/1 software tool for computer system capacity planning is a high-speed modeling facility that predicts system performance characteristics including throughput and response time, according to the vendor, BGS Systems, Inc.

Best/1 predictions take into account the hardware configuration, the system software and the application workload being processed. These are specified by a small set of parameters that state the speeds and capacities in terms that are easily available through accounting packages and hardware/software monitors.

The level of detail provided by a Best/1 analysis can be adjusted to reflect potential changes in software or hardware or more accurate data as it becomes available, he said.

Release 4.0 of Best/1 is said to require much less CPU time than conventional computer performance simulators. This enables the system to operate effectively in interactive mode, allowing rapid analysis of various alternative configurations.

Best/1 runs on IBM 370s and costs $15,000. BGS can be reached through P.O. Box 128, Lincoln, Mass. 01773.

Update of 'UCC DBS' Handles 3344s, 3350s

DALLAS — Version 4.3 of the UCC Data Base System (DBS) from University Computing Co. (UCC) is said to include support for IBM 3344 and 3350 disks and improvements in the performance and resource protection area.

The software enables IBM 360/370 users to store and retrieve data in random or sequential mode for disk files and in sequential mode for tape files. It separates the definition of data from its use thus letting programmers work with the data without concern for its physical location.

Data and index buffer handling has been improved to provide a "substantial decrease" in I/O activity in both a batch- and an on-line environment, according to a spokeswoman.

Version 4.3 permits multiple occurrences of the same data element within a single records. The storage and retrieval of these data elements are controlled by user-defined keys embedded in the element; this permits greater flexibility in the data base design, the spokeswoman said.

The OS version of this release includes changes in enqueue processing that are said to provide more resource protection and to permit processing of identically named but physically distinct data bases.

The DOS version of this release includes a facility to override, at execution time, the installation-defined buffer parameters, she added.

UCC's Data Base System was designed for use under most IBM 360/370 environments, from DOS/360 through OS/MVS, the spokeswoman said.

UCC is at 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

Release Eases Installation Of 'Data-Text'

CULVER CITY, Calif. — Data-Text release 3.3, now supported by the Datatext Project, is said to simplify the installation of this statistical analysis system for social and behavioral science work on OS-based IBM 360/370s.

Featuring a natural language, Data-Text allows unlimited variables, free-form input and the processing of multi-punched data, according to a spokesman. Error messages are comprehensive, missing data values are handled and the correlation and factor analysis is not limited to available memory, he added.

The package includes procedures for basic statistics, frequency distributions, cross-tabulations, correlation analysis, t-tests and F-tests and multiple regressions, as well as others for cross-statistics, analysis of variance and covariance, he said.

Release 3.3 is available under annual lease with a first-year cost of $1,000, Datatext Project sources said from 5995 Sepulveda Blvd., Culver City, Calif. 90230.

Most graphics terminals are too dumb for words.

Even expensive models get tongue-tied when it comes to alphanumerics. But now there's a bright new graphics terminal that has a lot to say for itself.

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That makes it easy to add options or take care of maintenance. Not that downtime is a problem. Our terminals have such a good track record that we've lowered our maintenance price three times in the past two years. When you do need service, more than 1000 Systems and Customer Engineers worldwide are ready to take care of you. So why settle for any dumb graphics terminal when ours can figure in your picture? See for yourself by calling the Hewlett-Packard office listed in the White Pages. Or send us the coupon and give our 2648A alpha-graphics terminal a screen test.

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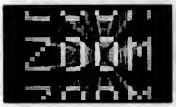

In-Depth Concern Needed

Service Analysis Shapes Form of Future System

By Stephen L. Robinson
Special to CW

Data Base Corner

In earlier columns I have been somewhat outspoken about the need to break the pattern of implementing old systems on new hardware. In this column, I shall discuss service analysis, which is a set of activities intended to ascertain what future systems should look like.

Since the advent of electromechanical accounting machine (EAM) equipment, data processing people have been reshaping business systems. Things that were done on an exception basis (e.g., computation of interest for savings accounts) in precomputer days became part of large maintenance runs.

After all, to update several cards in a deck, or to update several records on a tape, one had to "pass the whole file." It therefore made more sense to incorporate interest computation in a massive update of a savings file, an update in which every record was looked at even though only one-half of one percent of the records had transactions against them.

Such systems, of course, are "incompatible" with today's disk storage devices. The present peripherals are capable of efficient exception processing (especially for less than 10% of a file, certainly for less than 1% of a file). However, the systems being "upgraded" to disk are batch-oriented, full-file systems

Representative Skills

A casual conversation with bank employees, executives and even some systems analysts would seem to indicate the present system design truly reflects the needs of the banking organization. However, an in-depth, probing discussion reveals there is really no need to update the interest of each account daily. An aggregate interest figure, based on total deposits, is more than adequate for all decision making.

How to discover interest really need not be computed daily? Clearly, it is an easy task. It requires:

- A basic understanding of the business process being studied (i.e., savings accounts).
- A business "imagination" coupled with at least an elementary understanding of what computers can do (in this case, compute interest "on the fly" whenever a record is interrogated, for whatever reason).
- An interviewing skill (the ability to get people talking about what they do and what they need).

These are representative of the skills necessary to conduct a broad service analysis interview. Such skills are typically not found in individuals.

The Interview Team

An interview team of two people has proven ideal. When there are more than two, the interviewee (one, please, not a group) feels hopelessly outnumbered and persecuted.

The interviewers should previously have reviewed that portion of the information flow analysis (IFA) which pertains to the interviewee. In this way they are at least familiar with the documents the interviewee sees.

The interview should not turn into a "Do you get the agents' reports?" type of interview. Far from it..

The most effective ploy we have utilized is the "Dumb Dora" (or "Dumb Don" to avoid being called a male chauvinist pig) approach. For example, we ask questions like "How do you manage to schedule production for so many machines?"and "How do you anticipate demand at holiday time?"

Interspersed throughout this, of course are helpful suggestions (garnered from a study of the business area and developed by good systems analysis). "Would it be useful if you had a profile of last year's sales this time of year?" and "Would it be easier for you if the production and warehouse reports were somehow combined and summarized on one form?" are two examples.

No Leading Questions

This must be done carefully. The objective is not to lead the users by the nose nor to infer they are dummies if they don't use the information you are suggesting.

The recommendations are ideally given the same "Dumb Dora" fashion as the earlier part of the interview — for example, "I'm not really into manufacturing, but it seems to me that it would be useful to know..."

One of several things will happen.

- You will be told why that information would not be useful.
- The user will agree with you.
- The user will think about it, thereby giving him the opportunity in a week or so to write a memo indicating the need for a report with the information you suggested.

With regard to the last item, incidentally, all service analyses should terminate with the user being left with an official looking piece of paper called a "Wish list." Here the user is to enter any and all information he needs during the next couple of months, how he tried to obtain the information, whether the search was successful and, if not, why not.

This list also serves to cement the relationship between the information group and the users.

In later columns, I will discuss more about service analyses, its pitfalls, ploys to use with recalcitrant users and interview scheduling.

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Cobol Not High-Level Enough for DBMS

By Ronald G. Parsons
Special to CW

With software costs rising to 80% of the total hardware/-software expenditure, we are being forced to use languages optimized toward making better use of human resources as well as toward reducing hardware operating costs.

There are several obvious reasons why we need a very high-level language for use with data base management systems (DBMS). Looking at what a high-level data manipulation and definition language can do reveals increased productivity, especially when compared with the Codasyl Data Base Task Group data definition language and its associated Cobol data manipulation language extension, a very powerful but low-level language.

The language specified by Codasyl is referred to as a low-level language for several reasons: statements in the data manipulation language cause a single record to be affected; the programmer is required to do the navigating or searching in the data base; and the procedures (branching, testing and looping) required of the language in which it is embedded are complex.

In contrast, a language is classified as high-level when the aim of the syntax is to describe what to do rather than how to do it and when one statement can produce results which require several low-level language statements.

Two facets of increased productivity should be explored — the productivity of the hardware/software system and end-user and programmer productivity.

System Productivity

In a DBMS, the object of the productivity game is fewer I/-O operations. Low-level systems place much of the burden of selection of a record on the application program.

This may be adequate for retrievals and updates using a single primary key. However, it is unlikely that a primary key policy number will be much help to an executive of a large insurance company who wants statistics on the policyholders with claims greater than a certain amount during a given period.

It may be that the data base administrator of the Codasyl system caused one or both of the retrieval criterion items to be indexed, or perhaps some auxiliary sets were defined to facilitate such a search. Even so, the program (notice that a program is necessary to solve the problem) must process a large amount of data just to find the subset of the data base fulfilling the requirements of our request. This is because the Codasyl syntax supports only "equal to" value selection.

The low-level systems "get next record" philosophy gives the system only a microview of the problem and thus does not permit the system to make a global analysis. It is unable to choose an optimum solution.

Furthermore, each record to be processed or modified must be passed back and forth between a Codasyl-type DBMS and the application program. The communication path between the DBMS and the application program (perhaps running in a separate region) is therefore very busy.

In contrast, a high-level language can be given instructions to process a group of records, make some change and never have to pass the record from the DBMS to the application program. Such a request might be phrased:

```
CHANGE RATING-CLASS
TO '0' WHERE CLAIM-AMOUNT
IS GREATER
THAN '$300.00' AND
CLAIM-DATE IS BETWEEN
'01/01/77' AND
'06/30/77'
```

That type of syntax could be implemented for use with a host language such as Cobol or in a quasi-natural access language for end users. Interprogram communications traffic is reduced to the bare minimum — the problem request text (or call) from the application program and the acknowledgement of success or failure from the DBMS at the completion of the command.

In a distributed environment, this communication path may be a telecommunications channel. Reduction of traffic in that case is probably essential.

We also have to assume that the implementation of the high-level language system will be very sophisticated. It is often said high-level languages produce less efficient code and require more memory than the code for the same problem written in a low-level language.

While this might be true for a highly optimized low-level problem solution, it is seldom true of the usual low-level solution. With data base management access languages, the high-level implementation, with its capability for global optimization, will require fewer total resources to be used in solving a problem. Such high-level systems will tend to be more efficient than the *usual* implementation on the best of low-level systems.

Personnel Productivity

A high-level system permits the end user or programmer to express *what* is to be done, not *how* it is to be done. In fact, the user of a high-level language may not even know (or care) how a question is being answered or in what manner the physical data structure is transformed into a logical view of the data.

This implies that the high-level language should use an item orientation in the syntax of the user language as opposed to an orientation toward records or even subsets of records.

Low-level systems such as Codasyl preserve the record orientation through the subschema concept. A subschema can contain data items from only a single record in the schema. Thus, it is important to the programmer to know whether birth date and address are in the same record.

The retrieval syntax and program logic are sensitive to this information. A significant amount of data independence is lost.

We must assume the implementors of a high-level data base management access language will provide general solutions to commonly recurring problems. We can expect the high-level system to process arbitrary Boolean expressions (AND, OR, NOT), to handle comparative operators such as "equal to" and "greater than" and to permit different logical views of the same physical data.

A Codasyl DBMS, for example, provides facilities for direct access to a record or group of records on the basis of set membership or by specifying a value or group of values which must be contained in the record. Relational operators other than "equal to" are not supported, nor are arbitrary Boolean combinations or qualification conditions.

If the application requirements demand it, the Codasyl data base may have to be restructured to provide auxiliary sets which facilitate the search or else extensive programming will have to be performed.

Time pressures usually prevent application programmers working with low-level languages from developing these general methods on their systems. Even when they do, the distribution of these solutions is rather narrow.

With a high-level language, the services of a programmer are not needed for requests of a nature that a statement or two can generate the desired results.

Other Considerations

Besides system and programmer productivity, many other factors are affected by the level of access language. One such factor is transportability.

Cobol programs are said to be transportable, but how often have you seen one of any complexity moved from one host to another without change?

It is tempting for hardware vendors to produce and supply software not easily transportable to other host computers — especially hosts of different vendors.

The conversion effort required when hardware from a new vendor is acquired is of such magnitude that vendors are changed only rarely. This certainly holds true in the area of DBMS, which utilizes or controls much of the resources of a computing center. And it is in this area that a high-level language is most productive and can be most transportable.

Software engineering considerations mandate that the solution to a problem should be easy to read, maintain and understand and be self-documenting.

The designers of the syntax of the language must tread carefully between the extremes of conciseness and verbosity.

In these software engineering considerations, the Codasyl data definition language falls short. Its verbosity alone is overwhelming. And it intermixes diverse attributes of an entity. A well designed high-level language must provide solutions for these situations.

Parsons is assistant to the executive vice-president of MRI Systems Corp., Austin, Texas.

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Text Editing. QED is a powerful text editor for creating and modifying text from a time-sharing terminal. Its command structure is easy to use even for non-programmers but it also has the capacity to do elaborate jobs even for experts. GCOS-QED runs on the Honeywell 600/6000. TSO-QED on the IBM 360/370.

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Computer World

8080-Based 'Famos' Gets File-Handling Facility

CANOGA PARK, Calif. — The Fast Multitasking Operating System (Famos) software for disk-based 8080 microprocessor systems has been enhanced with extended file-handling capabilities, according to its vendor, MVT Microcomputer Systems, Inc.

At the same time, a new version of MVT-Basic, a multiuser Basic compiler that serves as a primary component of Famos, has been released. I/O extensions make the language "ideal" for application programming, according to a spokesman.

The Famos update is said to support all file access methods, including Isam and random organizations. File record lockouts are provided to avoid concurrent updates by two or more users.

The system is now totally device-independent, he claimed, adding that "any mix" of floppies and "hard" disks can be simultaneously supported. In effect, any random-access storage device can be included in the file structure, he said.

Variable block sizes, defined by the programmer, are supported while record blocking, included in MVT-Basic, is done by the system. A manipulation feature allows blocks to be inserted or deleted anywhere in any file, the spokesman said.

The system permits creation of "virtually unlimited" file sizes, including support for files spanning more than one disk drive. The sector allocation scheme is augmented by a file system integrity maintenance feature, he added.

Backing for reentrant coding and a reentrant runtime system enable Famos to support 20 to 30 terminals simultaneously. Execution speed has been enhanced through overlapping of interrupt and noninterrupt-driven processes, the company said.

Famos and the multiuser Basic compiler, including an S-100 bus-compatible vectored interrupt/interval timer board, costs $2,050 and is available from the vendor at 21822 Sherman Way, Canoga Park, Calif. 91303.

Courses Set for Programmers, Managers

WASHINGTON, D.C. — Programmers and DP managers are the intended students of a pair of short courses scheduled this month by the Continuing Engineering Education Division of George Washington University.

"Structured Programming and Software Engineering, Short Course 374," will run Jan. 16-20. It should provide experienced personnel with a technical update in logical expression, analysis and invention in designing and building software based on sound architecture, according to a spokesman.

The course will cover discussion and application of structured programming and software engineering principles including stepwise refinement, program correctness and top-down system development. This $495 course includes workshops and lectures, the spokesman noted.

"Short Course 236, Configuration Management of Software Programs," will meet Jan. 23-25 with several interrelated goals. It will review, for example, the relationship between hardware and software configuration management and will provide an insight into the technical and managerial aspects of a computer program contract, the spokesman said. This course costs $395.

The director of the Continuing Engineering Division can be reached at George Washington University, Washington, D.C. 20052.

Account Work Runs on 3s, 32s

WARRENVILLE, Ill. — Despite its name, the Basic Accounts Payable (BAP) package was written in RPG-II for use especially with IBM System 3s and 32s, according to the vendor, Katwil International.

The package consists of 10 programs and various utilities to produce "everything" from edits through maintenance of the master vendor file, a spokesman added. It has provisions for manual and voided checks, dating and discounts, he said.

The package costs $200 and can be ordered through P.O. Box 217, Dept. B, Warrenville, Ill. 60555.

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NAC Adds Network Design Software

By Ronald A. Frank
CW Staff

GREAT NECK, N.Y. — An interactive network design service for users with limited design expertise has been introduced by Network Analysis Corp. (NAC).

Called the Modular Interactive Network Designer (Mind), the package allows users to access a specialized data base of network design parameters via the Telenet network.

Mind is written in Fortran and runs on a Digital Equipment Corp. Decsystem-20 under the Tops 20 operating system. It utilizes about 128K of storage at the CPU installed at Bolt, Beranek and Newman, according to Aaron Kershenbaum, director of network design services at NAC.

The Mind package consists of three modules: a network editor, a topological optimization module and a multipoint line simulation system. An executive program acts as a supervisor for the modules and guides the user through the design process, according to NAC.

CW Photo by R. Frank

Aaron Kershenbaum (left), developer of the Mind network design modules, discusses the system with Howard Frank, NAC president. Imlac PDS 4 graphics terminal was used to demonstrate the design tools.

The executive provides information to the user in ordinary English so the proper commands can be selected. As the user develops greater familiarity with the self-help command structure, productivity can be increased by bypassing these features, according to a spokesman.

The network editor is a data base system into which the user enters information describing the network. The edit module accepts location data in the form of telephone area codes and exchanges; this data is converted into the V&H coordinates which are used in network design work.

The topological module will design a centralized multipoint line layout satisfying the user's requirements at the lowest cost, based on AT&T MPL interstate private line tariff, NAC said. The module can accept nets up to 1,000 nodes in a single design run and can be used to configure a new network or modify an existing one, the spokesman noted.

The topological module allows users to obtain "dollars-and-cents answers" on the economies of inserting multiplexing or concentration into a network, he said. Given data on the failure rates of hardware and line facilities, the module will compute the expected availability rate of a specific configuration.

This provides the user with information on making an optimal investment in redundant hardware and/or line facilities, according to NAC.

The multipoint line simulation system module allows the user to obtain a throughput/response time analysis of a network configuration. It calculates the effect on network performance of such varying parameters as terminals per line, traffic load, message length, line speed, device characteristics and protocol, the spokesman said.

The design service can be accessed with asynchronous CRT or hard-copy Ascii terminals operating at 300- or 1,200 bit/sec on the Telenet network. As part of the service, NAC provides user training, documentation and up to four hours of free consulting time to assist the user.

The network design service includes two rate elements. The user pays a flat rate of $5,000 for the first six months and $4,000 for each successive six-month period. A second, usage-sensitive rate is assessed at 20% of the user's CPU usage charges.

NAC is at 130 Steamboat Road, Great Neck, N.Y. 11024.

ACS Becomes First U.S. User Of X.25 Over Public Packet Net

WILMINGTON, Mass. — Avco Computer Services (ACS), part of the Avco Systems Division here, reportedly has become the first user in the U.S. to utilize X.25 protocol over a public packet network.

Successful testing of this CCITT-approved protocol for connecting data communications equipment to packet networks was completed this fall in conjunction with Telenet, the first U.S. network to support X.25, and Cambridge Telecommunications, Inc. (CTX) of Bedford, Mass., developer of the DMEP X.25 software package for IBM systems.

The DMEP software at ACS operates in the IBM 3705 front end attached to a 370/158. It translates synchronous traffic from Telenet into asynchronous mode for entry into the IBM CPU. The DMEP package also makes the remote terminals in the Avco network appear to be operating in local mode to the 3705.

By having the terminals appear to be operating in local mode, Avco avoided making changes to its IBM Time Sharing Option (TSO) Tcam software. Terminals utilizing the TSO network include IBM 2741s, teletypewriters, Ascii CRTs and Tektronix, Inc. graphics displays, all of which are operating at Avco client sites around the country.

ACS' first commercial DP clients were in the New England area, but the company soon found itself in the position of having to provide communications from as far away as Florida and the West Coast to serve the requirements of multilocation companies.

"It was clear we needed a nationwide network, and it is not very feasible for a company our size to build one," according to Gene Cort, manager of technical services. "We're not communications specialists."

Cort and ACS Director Richard Bibaud considered the value-added carriers to be their only real option. "We chose Telenet because of what this carrier is doing in synchronous communicatons with X.25," Cort explained. "A software interface means less equipment for us and makes it possible to run 3270-type applications in the future over the same network."

(Continued on Page 44)

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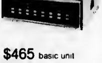

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Printer Terminals Ease Handling of Passbooks

By Christopher K. Watson
Special to CW

ROCKVILLE, Md. — County Federal Savings and Loan Association here, with assets of $100 million, is unique among savings institutions of that size. County Federal employs minicomputers with its passbook savings application; the association also maintains a full-time DP staff of four.

County Federal attributes its successful employment of minicomputers in the savings and loan business to the continuing reappraisal of its equipment capabilities. As a result, the association is currently replacing all of its printer terminals with newer, more effective units having the passbook insertion feature. The Carousel 350 printing terminals from the Terminals Division of Perkin-Elmer Data Systems have made a big difference.

Currently operating four savings branches, County Federal has two more scheduled to open soon. Each branch now uses the Carousel 350 printing terminal for normal savings transactions — deposits, withdrawals, passbook updates and status of accounts. Each branch terminal communicates with the Data General Corp. Eclipse C/330 minicomputer at the main office over a 300 bit/sec dedicated communications line.

In addition to the 192K-byte CPU, there is an additional 96M-byte disk storage drive and a 9-track magnetic tape drive. Remote terminals include the Carousels and several DG 6012 CRTs, which are being replaced by Perkin-Elmer Model 1100 interactive CRTs.

Previous equipment included a DG Nova 830 and printer terminals that required extensive modifications.

Passbook Savings Only

County Federal uses the Carousel terminals only for the passbook savings application. The association does not offer statement savings at this time.

In the process of making a deposit or withdrawal, the terminal prints first on a carbonized journal roll through the deposit or withdrawal slips.

Then, in that same area, right over the top of the journal roll, the teller inserts the passbook into a front-form-feed device. This causes the passbook to be pulled into position where the correct entry is made.

Automatic Positioning

In essence, the passbook positions itself automatically; it is no longer necessary to insert the passbook manually.

An advertisement brought the Carousel to County Federal's attention. Specifically, it was the front-forms-feed device that aroused initial interest, for at that time, association tellers were manually inserting the passbooks into the printer terminals.

In July 1977, County Federal brought one of the Carousels in on a trial basis. The print quality was immediately apparent. Both the existing terminal and the Carousel have plastic print wheels, but the existing terminal's wheel was subjected to more strssses and would break frequently.

The Carousel's cartridge slips in quickly, with no mess, unlike the old terminal.

No Modifications

The Carousels need no modifications by County Federal. The terminals being replaced had two costly modifications. First, key switches were installed for security purposes.

Then, because the old terminals were designed to work in a binary system, an interface had been designed and manufactured to interface those terminals with the DG processor, an Ascii system. With the Carousel, daily passwords are used, and these terminals already understand Ascii.

The tellers at County Federal find the Carousel easier to operate. Now the computer and the Carousel do the forms positioning and the operator simply inserts the form into the front-form-feed.

Former Procedure

Previously, the operator had to open the carriage, insert the form, close the carriage, visually align the form and remove the form. This procedure was repeated for both the passbook and the deposit or withdrawal slip.

County Federal processed its work on a DG Nova 830. The association's growth, however, has been a little faster than anticipated. A DG Eclipse C/330 has now replaced the Nova 830. Yet, having chosen to go the route of the minicomputer, County Federal is not burdened with the problem of finding ways to pay off expensive DP equipment. Now there is no need for the DP department to perform services for other businesses and the staff of four is able to concentrate on its own applications.

Christopher K. Watson is assistant vice-president for information services at County Federal Savings and Loan Association, Rockville, Md.

ACS First in U.S. to Use X.25 on Public Packet Net

(Continued from Page 43)

The DMEP package was designed to run on an IBM 3704 and 3705 front end without any modification to existing host software. The ACS system is linked to a Telenet switching center in Boston over a 2,400 bit/sec private line.

Many simultaneous connections can be handled efficiently with this bandwidth, Cort said. It will not be necessary to increase the bandwidth to handle additional connections until a new IBM 3033 arrives this spring.

Initially ACS converted most of its low-speed users to Telenet. This move enabled the company to remove two Band 5 Wats and several FX lines at a savings of about $1,800 a month.

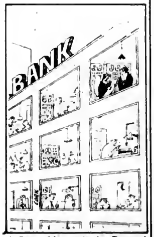
In comparison, Telenet charges will be less than $700 a month for computer access plus $2 to $5 an hour for terminal connection time, Cort said.

ACS uses Telenet's Network Virtual Terminal option, which translates all data into standard Ascii format and, in effect, makes all terminals look alike to the host computer. The option also relieves the host computer of certain editing and echoing functions that are performed at local network level.

"Telenet has opened up terminals we had difficulty supporting before and handles them very well," Cort said. "We are also going to be using Telenet's tape support, which our TSO software does not handle efficiently."

In commercial operation since 1958, the Avco subsidiary operates the largest commercial data center in New England. Its present equipment includes two 370/158s and one 360/75 as well as a California Computer Products, Inc. CRT plotter.

In addition to its interactive services via TSO, ACS provides batch processing and remote job entry and offers digital graphics capability, systems analysis and programming services.



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26 Stores in Net

Supermarket Terminals Perform S&L Tasks

ORLANDO, Fla. — A network of customer-operated terminals in 26 Kash 'N Karry supermarkets here is performing savings and loan transactions. Depositors of six different savings and loan associations in a three-county area surrounding Tampa and St. Petersburg can take advantage of the service at no cost.

Called Modern Money, the service extends savings and loan transactions to supermarket hours and locations by allowing depositors to cash checks and make deposits and withdrawals from their savings accounts.

The transactions are electronically transmitted against a customer control record or switching to the savings and loan data center for authorization

The electronic funds transfer (EFT) techniques are implemented over 1,200 bit/sec asynchronous telephone lines and backed up with written copies of every transaction.

To minimize the use of supermarket personnel, the terminals are customer-operated and are located away from the customer service counter and cashier areas of the store.

System Security

Security is maintained by plastic Modern Money cards containing magnetically encoded information about the depositor and secret identification codes that must be entered before the terminal will accept or verify a transaction.

All cash transactions are handled by the supermarket service counter employees after verification by the terminal.

The supermarket terminal transactions are identical to savings and loan transactions: withdrawals are immediately deducted from savings balances, deposits are credited subject to collection and checks are cashed against savings account balances until the checks clear.

On a daily basis, the savings and loan association receives a statement of each customer's account and a complete listing of all transactions. The supermarket merchant receives a complete reporting of every transaction (to use in balancing his cash accounting) and a weekly summary (to monitor store traffic patterns as they are affected by the terminals.).

A Data General Nova 3 minicomputer with 80K bytes of memory performs the file and communications processing for the network. The personal identification code, account status, Modern Money card expiration date, listing of the types and limits of allowable transactions and a running current seven-day total of allowable transactions are maintained on a 92M-byte disk.

File updating of this information is provided via an on-line CRT after telephone inputs are received form the savings and loan. Terminal transactions are processed by the Nova 3 on a time-sharing basis and electronically relayed over phone lines to the DP center that maintains the master files for each depositor.

Other computer peripherals used in the network include a DG Dasher printer, 1,600 bit/in tape subsystem, 300 line/min printer and DCU/50 data channel interface.

Software for the system was provided by Transaction Data Systems and the network design by Systems Technology, both Orlando-based companies.

After a second Nova 3 is installed for the network within a few months, communications processing and file processing will be separated between the two minicomputers, a spokesman noted, adding the network can then accommodate up to 500 terminals.

To the Modern Money cardholder, the service is said to facilitate shopping, check cashing and savings and loan transactions. The supermarket retailer reportedly enjoys increased store traffic, lower check cashing and credit card costs than with an in-store system and less employee time required for these activities.

A Modern Money terminal is shown operating in a Kash 'N Karry supermarket.

The savings and loans use the network to increase their service hours and locations at a cost that is shared by various financial institutions, since Modern Money is a statewide network, the spokesman noted,

The participating supermarkets are located in Pinellas, Hillsborough and Pasco counties surrounding Tampa and St. Petersburg. The six sponsoring savings and loan associations are Florida Federal Savings & Loan Association, Franklin Federal Savings & Loan Association and Guaranty Federal Savings & Loan Association, all of St. Petersburg; Freedom Federal Savings & Loan Association of Tampa; First Federal Savings & Loan Association of Tarpon Springs; and First Federal Savings & Loan Association of Winter Haven.

Florida S&L Development Corp., an Orlando-based marketing and development firm, was formed to develop a cooperative EFT system for the savings and loan associations of Florida that could be shared with other financial institutions. The firm is owned by 82 Florida savings and loan associations.

Mobile Device Handles Storage, Communications

OAKLAND, Calif. — A mobile data storage and telecommunications device — the Cassetterm II — has been announced by Micon Industries. Described as a second generation of the Cassetterm, the latest model reportedly provides greater flexibility through microprocessor-based design.

Improved features include a minicassette memory system for serial storage and readout of up to 40,000 alphanumeric characters per cassette at 110 or 300 bit/sec rates, universal acoustic coupler that accepts most telephone handsets, a 32-char. display panel and full Ascii compatability, the firm said.

Rechargeable battery operation and portability is important for many customer applications, it noted.

The Cassetterm II costs $1,995. Options such as an RS-232C direct interface module and AC line power are available. Micom Industries is at 252 Oak St., Oakland, Calif. 94607.

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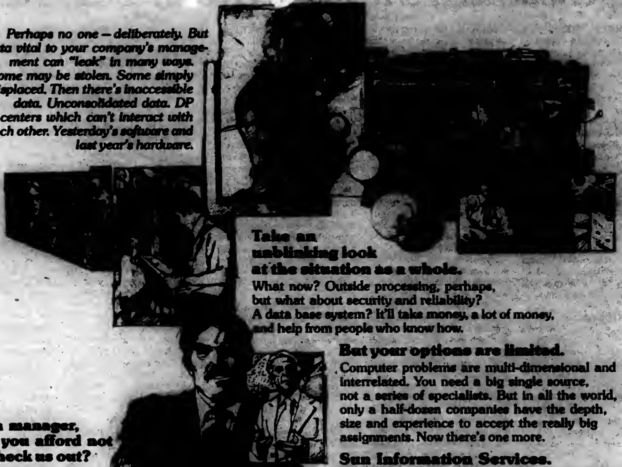

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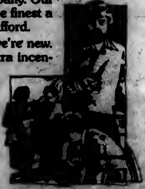

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Adding 3790 Emulation

CA to Provide SNA/SDLC Support for Syfa

IRVINE, Calif. — Computer Automation, Inc. will provide users of its Syfa network processing systems with Systems Network Architecture (SNA) compatibility, including the availability during 1978 of an IBM 3790 communications controller emulation package, using Synchronous Data Link Control (SDLC) line protocol.

The emulation package enables a Syfa network processing system to appear as a 3790 communications controller to an IBM mainframe while offering users local processing and mass storage capability in addition to batch and interactive communications, the company said.

In implementing SDLC, the firm is utilizing a programmable controller containing a microprocessor.

This approach reportedly allows the offloading of SNA/SDLC overhead functions from the Syfa central processing unit to the microprocessor, which has its own 16K dedicated random-access memory (RAM), a spokesman said.

The microprocessor, which is loaded dynamically from the Syfa CPU, is said to provide the flexibility to adapt to future possible changes by IBM in network protocol details.

The 3790 communications capabilities are provided by the SDLC processor functioning in conjunction with an SNA-3790 software emulator executing in the Syfa CPU's main memory. This combined software/-microprocessor approach allows the system to emulate future IBM SNA products by writing additional software emulators to operate in conjunction with the SDLC processor, the firm said.

SNA communications will be initiated and/or received via any of the 24 terminals running applications on the system. These applications are written in the Syfa Business-Oriented Language (Sybol). Special read- and write-type commands in the Sybol language will be used to send information up or down the communication line. The Sybol application programs themselves can either be developed on the local Syfa systems or can be centrally developed for all distributed Syfa systems and then down-line loaded from the central step, according to CA.

Syfa's SNA-3790 communications capability will support all SNA commands with proper responses and handshaking, the company said.

The SDLC processor is priced at $7,500. The SNA-3790 software emulator is also priced at $7,500. The Syfa network processing system itself is priced from $29,000 to over $100,000 depending upon the particular configuration of peripheral and storage units.

First delivery is scheduled for the third quarter of 1978 from Computer Automation, Inc., 2189 Dupont Drive, Irvine, Calif. 92713.

WU Requests Rate Changes For TWX, Telex

UPPER SADDLE RIVER, N.J. — Western Union has filed with the Federal Communications Commission (FCC) for a revision of its Telex and TWX rates within the 48 contiguous states. Usage rates would decrease for long-haul traffic and increase for short-haul messages if the application is approved by the FCC.

If the majority of a user's calls are long-haul, there will be a decrease in the customer's billing. If short-haul calls predominate, a customer's bill will increase, a spokesman said.

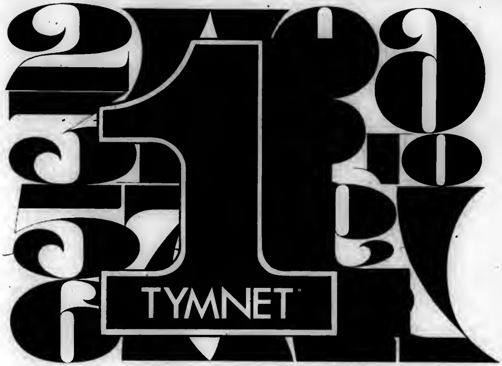
For Telex subscribers, the present rate for the longest haul route will change from 60 cent/min to 52 1/2 cent/min, while the shortest haul route will change from 17 1/2 cent/min to 22 1/2 cent/min. This means that a 30-word message can be sent coast-to-coast for approximately 26 cents. The number of rate steps will be reduced from four to three, if the rate changes are approved.

Telex-to-Telex and TWX-to-TWX Infomaster store-and-forward service rates are being revised consistent with charges for the direct-dial service for both Telex and TWX service. Rates for Western Union Infomaster services other than Telex-to-Telex and TWX-to-TWX remain unchanged, the firm said.

For TWX customers, the longest haul interstate call dialed by a subscriber will be changed from 70 cent/min to 52 cent/min; a 100-word message sent coast-to-coast will cost 52 cents. The shortest haul interstate call up to 40 miles will be changed from 20 cent/-min to 30 cent/min. The number of mileage zones will be reduced from 11 to five.

For remote access lines, beyond the city limits of the 623 TWX service cities, there will be a 75 cent per mile per month charge instead of the current 50 cent per mile per month charge.

Western Union also intends to file intrastate rates consistent with the interstate rates outlined above, a spokesman said.



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By incorporating the most advanced computer and communications technology in the network, Tymnet is able to offer its users a reduced operating cost plus a greatly improved communications facility.

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- full compatibility with all standard terminals and transmission codes
- "turnkey" network management for the user
- significant cost advantages
- the confidence and security that come from a packet network service with over 5 years of intensive operating experience

Domestically, TYMNET today provides access in over 130 cities — and the number of locations continues to grow. International operations can also be served by TYMNET, through interconnect agreements with the International/Record Carriers which provide access in major world cities, from Rome to Hong Kong.

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Conforms to NBS Standard

Motorola Offering Encryption Hardware

By Brad Schultz
CW Staff

SCOTTSDALE, Ariz. — Motorola, Inc.'s Government Electronics Division has announced a line of encryption hardware conforming to the Data Encryption Standard (DES) approved by the National Bureau of Standards (NBS).

The announcement of Motorola's Infoguard products roughly parallels in time that of IBM's encryption line [CW, Dec. 12].

Data protection by encryption entails use of a key — a string of bits — to encode data prior to storage or transmission and to decode data thus "scrambled" prior to accessing it. Scrambled data is therefore incomprehensible unless one has the key that scrambled it.

The Infoguard DES3100 Network Security Module (NSM) is described as suitable for "any application where sensitive data is exposed to clandestine monitoring and/or modification."

The NSM is suggested "for securing links between computer terminals, remote data job entry terminals and central computer sites between computers, and between intrusion monitors and a host processor," according to Motorola.

Motorola's Infoguard encryption line reportedly protects EFT applications, such as the "threat environment" shown on Page 59.

Another Infoguard intranet product is directed at electronic funds transfer (EFT) applications. The DES2400 Personal Identification Number Encryption Module (PEM) encrypts personal identification numbers (PIN) for remote financial transaction terminals.

The PEM accepts PIN data entered from a 10-digit keypad, enciphers it via the DES algorithm and outputs the enciphered text to a financial transaction terminal for transmission through a data network.

The PEM "can be customized to interface with user terminals . . . is compact and will greatly minimize fraud and counterfeit threats," Motorola claimed.

For Systems Development

Three Infoguard microprocessor-compatible Data Security Modules (DSMs) — designed to work with particular brands of hardware — are offered for use in systems development.

The MGD6800 works with Motorola M6800 microprocessor-based systems, and the MGD8080 works with Intel Corp.'s Micro Development System (MDS) and Single Board Computer (SBC) family, Motorola said.

The MGD6800 and -8080 set and load the key used in encrypting data or load a preset key for immediate use. Both are suitable for prototyping and engineering applications, a spokesman said.

The third Infoguard DSM

(Continued on Page 59)

Bank a Winner With $57 Loss As It Brings COM Service In-House

Special to CW

ALLENTOWN, Pa. — Upper management usually frowns if a DP operation loses money, but when the First National Bank of Allentown lost $57 one month on part of its operation, the loss proved the DP department had made some right decisions.

The bank had utilized the service of a computer output microfilm (COM) service bureau for three years when management developed a timetable for converting to in-house operations. The bank was experiencing a 5% monthly growth in COM volume.

"We were planning for a mid-1978 equipment acquisition date," according to John Weinstock, the bank's vice-president of DP, "not only for monetary reasons, but also for convenience. We could have used several new microfiche applications requiring immediate turnaround that were found impractical with an off-site service bureau."

But last May the bank's COM timetable changed as its bureau announced its departure, along with a cessation of its services.

Weinstock studied the alternatives then open to the bank — either to use another service bureau or to bring COM operations in-house earlier than scheduled. He felt that if he could limit the bank's microfiche volume and keep new applications to a minimum, he could cost-justify using the bureau for a maximum of six months. He anticipated, however, that two of those months would be required for a break-in period.

Weinstock instead proposed the immediate acquisition of in-house COM equipment to the bank's board of directors. He prepared a break-even analysis chart to compare COM service bureau costs with those of an in-house unit at incremental production volumes.

The chart showed the break-even point was 1,600 master microfiche and 6,400 duplicates per month. If the bank's growth rate continued, its volume would reach that point in June, the same month the bureau would be discontinuing its service.

In addition, the bank would be acquiring Northampton National Bank that month, further increasing COM volume by 300 masters and 1,600 duplicates.

The proposal stated that because the bank's existing DP staff included both an operator and programmer, additional personnel would not be required.

The convenience of in-house microfiche management would give the bank the turnaround it needed for adding the cost-saving applications that had not

(Continued on Page 53)

Auerbach Gives Operations Tips

By Tim Scannell
CW Staff

PENNSAUKEN, N.J. — There are two ways to run computer operations — from memory or by the book.

Operating from memory is asking for trouble because it creates indispensable people; going by the book requires that procedures be correct and not too obscure or voluminous to follow, according to a publication released by Auerbach Publishers, Inc.

"Data Center Operations Management" is actually a series of continually updated portfolios designed to acquaint the operations manager with solutions to problems involving planning, budgeting, personnel, efficiency and user/vendor interaction, Auerbach said.

Written in a "how-to" fashion, the publication attempts to help managers anticipate problems by presenting various examples that depict instances where these problems might occur, the publisher stated.

In one section, "How to Improve Internal Communications," the idea that management is dealing with people is stressed with the emphasis on employee morale and satisfaction.

"Staff members who are not asked for their ideas and comments feel unimportant and their morale is lowered," according to the publication. When employees are not informed of changes or not asked to take part in group meetings, "there is an increase in inefficient job performance . . . and a feeling of competition and resultant isolation is fostered."

The pros and cons of memos

(Continued on Page 58)

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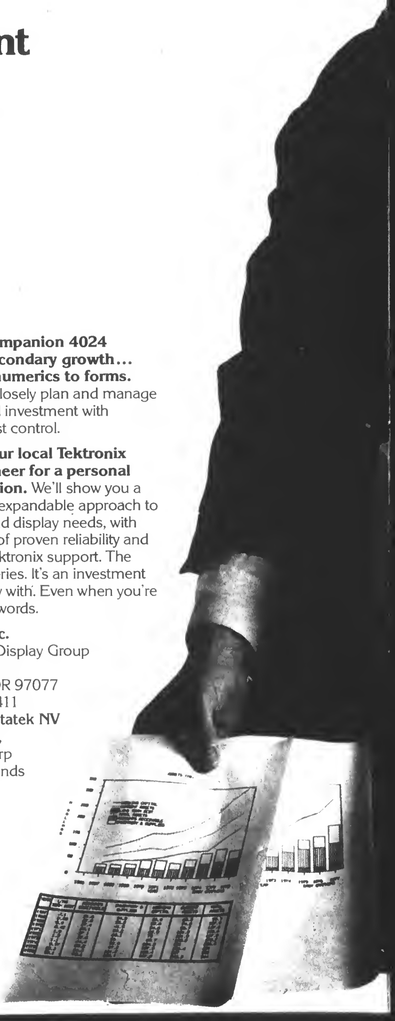

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Century-to-Criterion Move Ups Production 25%

By Tim Scannell
CW Staff

TAUNTON, Mass. — A manufacturer with 11 factories throughout the U.S. experienced a 25% increase in production after upgrading from an NCR Corp. Century 100 to that firm's Criterion system.

Robertson Factories, Inc., based here, produces such home products as curtains, draperies and bedspreads that are sold mainly through Sears, Roebuck and Co. stores. The Criterion system, in processing more than 1,000 orders per day, controls everything from the shipment of raw materials from the mills to the delivery of finished goods, billing and accounts receivable, according to Ibrahim M. Abdallah, Robertson's vice-president of information systems.

When it is received, each order is assigned a number that becomes its file address within the system. The computer checks the inventory to see if the necessary raw materials are in stock.

If they are, the computer assigns the order to the factory nearest to the customer.

Two Networks

"We have two communications networks operating over the switched telephone network," Abdallah explained. "The first one is a stand-alone network which communicates with a computer at Sears in Chicago, where the retailer accumulates orders. By dialing, I can automatically pull all their orders into our system."

The second network is used for communications between headquarters and the factories. Each plant dials the home office daily to receive orders, exchange administrative messages and transmit data on shipments for the day. All of this is done through a terminal at each factory that is equipped with a line printer which prints out the data from disk off-line.

The Criterion in Taunton deducts the raw materials from inventory, pulls the order information from the disk file and then invoices and debits customers in the accounts receivable file,

(Continued on Page 55)

User Wins With $57 Loss

(Continued from Page 49)

been feasible with the service bureau.

The bank's board of directors gave the go-ahead for the acquisition, and Weinstock began studying several types of COM equipment. To save on processing time from his NCR computers, he decided to use a minicomputer-controlled recorder. The mini would also facilitate conversion of additional application to COM.

To keep labor time to a minimum, Weinstock looked for a maximum of automatic operational features in the mainframe. For microfiche duplication, the convenience and lower supplies costs of vesicular processing led him to switch from the diazo supplied by the service bureau.

With these basic requirements for a system, Weinstock compared suppliers. He chose a Mini-Autocom recorder and Autofiche duplicator from Datagraphix, Inc. They successfully filled his requirements and could easily be integrated into his DP environment, he said.

Two weeks later, the system was delivered. "To be quite frank about it," he said, "the changeover was better than I expected." The Autocom arrived on a Wednesday, three days before the service bureau discontinued operations. By 9 a.m. Monday, the first microfiche copies had been delivered to users throughout the banks.

Ten minutes later Weinstock received a phone call from one of the bank's heaviest COM users. Her comment was: "John, they're beautiful!"

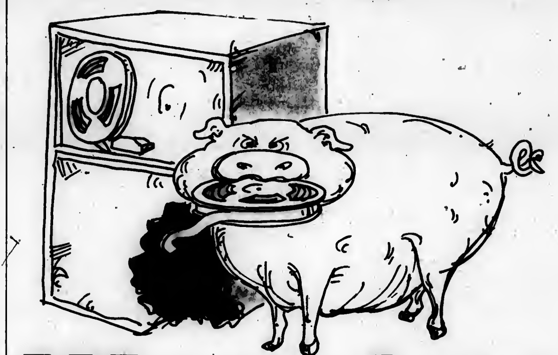
"This is the first time I have ever gone to a new system and had users actually compliment me on the product," he said. "I knew then that the system had passed the test ... and we have been live ever since."

The bank now produces daily abbreviated trial balances on microfiche for its 190,000 customers in 26 branches as a "real-enough-time" backup for its extensive on-line system. A history file created by the cross-indexed activity trial balance provides answers to customer account inquiries, saving enough research time to free two employees for other banking responsibilities.

The trust records and miniledgers, which previously consisted of up to 15 paper addendums to each account, are now updated each morning as a group on microfiche, saving hours filing and retrieval time for the bank's employees, Weinstock said.

For its archival records, the bank stores original microfiche in an off-site warehouse after copies are made for immediate use. So much space has been saved by the use of microfiche for archival records that the purchase of an additional storage facility has been forestalled at least one year.

In the first month of operation, the actual costs of the in-house system were only $57 over equivalent service bureau charges, indicating the bank's conversion to in-house COM was made precisely at the break-even point. The bank's present volume of 2,000 master microfiche and 8,000 duplicates is saving the bank $800 this month, with greater savings anticipated every month.



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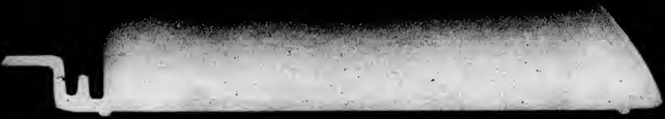

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MEMOREXCELLENCE

Units Seven Miles Apart

On-Line Units Handles 'Split' Hospital's Payroll

By Tim Scannell
CW Staff

PROVIDENCE, R.I. — St. Joseph Hospital, a 500-bed voluntary hospital separated into two units that are seven miles apart, has implemented a computerized payroll/personnel data system using a large-scale mainframe and a series of remote terminals.

The heart of the system is an IBM 370/138 system that is connected to a number of electronic time recorders placed strategically throughout the two units, Our Lady of Providence and Our Lady of Fatima, according to John W. Flynn, fiscal services director at St. Joseph's.

Each employee on the hospital staff is given an identification badge with a magnetic strip on the back containing a numerical code. All the information concerning that person is entered into the computer and a file is built that includes such things as his position in the organization, tax data and attendance records.

The information is then "leveled" as to its retrieval capability, protecting each employee's privacy while giving access to current personnel data by appropriate officials, Flynn said.

Key to Success

The key to the system's success, according to Flynn, is the direct connection of the time recorders to the CPU.

"We installed nine IBM electronic time recorders in the two hospital units. They are tied directed into the computer. When an employee 'badges in,' his time is encoded right into the system.

"There are no time cards and so no need to either keypunch those cards or to interpret individual payroll eligibility for shift differential, overtime, etc.," Flynn said.

At the end of each pay period, printouts are returned to the supervisory people for approval. Although the CPU has done all of the required calculations, supervisors check the employee's sheet for such things as sick days, holidays and vacation time, Flynn stated.

Alterations or corrections are then made on-line through a CRT terminal and the check is printed directly from the processed data.

The 1M-byte 370/138 configuration at the hospital operates in a DOS/VS environment. The system includes 10 Model 3330-1 disk drives with 100M-byte storage capacities, 32 Model 3410 80K-byte tape drives; a 3505 card reader, a 3525 card punch, a Model 1403-N1 printer with a speed of 1,100 line/min, 36 local terminals and 15 remote terminals, according to Norman Berube, acting DP director.

The benefits of the system are numerous, Flynn said. "In one department alone there are 24 different shifts and eight different ways an hourly employee can qualify for five separate rates of overtime pay under our policies," he noted. "The computer is programmed to recognize each employee's pay grade, so the tremendous amount of paperwork and potential for human error is totally removed."

Budget analyses, overtime reports and detailed employee paycheck and deduction statements are also prepared by the system, relieving the supervisors of these duties, he added.

"By dropping keypunching and various clerical functions, we have enabled the staff to engage in other work," Flynn noted. "We have also substantially upgraded the availability of a wide variety of direct and ancillary personnel data.

"For example, we are able to ask the computer to provide analysis of future retirees as of a particular date and their projected benefits. The answer is available in seconds, without the need to wade through a substantial number of individual files or group data," Flynn said.

(Continued on Page 59)

Upgrade Boosts Production 25%

(Continued from Page 53)

Abdallah said.

The system is built around a Criterion 8550 CPU with 196K bytes of memory. It includes two NCR 634 tape drives that are switch-selectable for either phase-encoding or NRZ; four Model 658 disk drives with 100M-byte capacities; and an NCR 647 printer.

The system also contains a file on all contracts that are taken out with the mills, including their terms, Abdallah said. If a mill delivers an excessive number of "seconds," the computer compares the data with the contract terms and notes the deviations.

A file is also used in the inventory control program, which is used to determine the status of any style or color of material. As mill shipments are made, goods are added to inventory and deducted from the appropriate mill's contracted amount.

The possibilities of the present system are many, according to Abdallah. The information systems staff is experimenting with a forecasting program by accumulating histories of trends by style, color and the percentage of colors within each style.

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For more on how Prime can help, write Joseph A. D'Angelo, Director, Market Planning, Prime Computer, 40 Walnut Street, Wellesley Hills, MA 02181.

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Fiche Accessory

SMYRNA, Ga. — Curtis 1000 has introduced a line of microfiche filing and mailing envelopes fabricated from acid-free paper that reportedly feature neutral gumming seams.

The envelopes will not chemically degrade the microfiche they hold, a spokesman claimed. Two styles are offered, one with an open top and the other with both an open top and open side.

Both styles have no front seam to snag microfiche as it is inserted, the spokesman said.

Prices of the envelopes range from .6 cent to 1 cent each in quantities of 1,000 with an additional cost for printing from Curtis 1000, 1000 Curtis Drive, Smyrna, Ga. 30080.

Tips for Operations Managers Published

(Continued from Page 49)

are also discussed in the section on internal communication. "The advantages of memos over verbal communication are less consumption of time, more precise expression and their availability for later reference," according to this section.

On the other hand, "feedback to the sender is usually nonexistent or delayed; a memo may not be clear or complete, and thus require additional communication . . . and a memo does not permit the sender to be sure of the receiver's response, understanding and feelings.

Successful Recruiting

"In the normal daily onslaught of problems, there is sometimes a tendency to forget that the basic ingredient of every organization is people," the section on recruiting operations personnel contends.

"For some reason it seems the ideal person to fill any given opening is already satisfactorily employed somewhere else."

With this in mind, the manual resolves that "finding the right person for the position is really a function of finding the right group of people from which an individual can be selected."

A recommendation from a reliable employee is the preferred method of selecting a candidate for employment, according to the manual. Professional recruiters, advertising in trade and community newspapers and; occasionally, a radio or television spot are listed as dependable alternatives.

Direct contact with schools is, however, recommended when an entry-level position is involved.

Screening and interviewing are also covered in the recruiting section, as well as what to expect from a new employee and what to do if that person does not live up to management expectations.

"It is possible the employee is simply mismatched to the job or the organization . . . If the employee cannot perform the job, consider the possibility of transfer to a more appropriate position.

"If no alternative exists, do not simply allow the employee to remain in the position with little or no advancement," the manual advises. "The definition of success in recruiting is placing the right person in the right job to attain the desired level of performance and satisfaction."

The section on establishing job flow procedures discusses why such procedures are necessary, what to expect from them, what tools are needed and how to put it all together. Job submittal forms, the need for error correction procedures and the problem of operator efficiency are among the topics outlined in this portfolio.

Also discussed is the programmer's involvement in the computer room and what steps an operator should take if a particular job's information is not clear.

"First ask the programmer to provide whatever is missing, even though you don't know exactly what that is. If the programmer provides no information, ask the programming manager to get it.

"If all else fails, either refuse to run the program until the information is provided or find out the programmer's home phone number and schedule the job for 4 a.m."

Maintenance procedures, including the proper care of magnetic recording devices, are also covered by the manual. So called shortcuts that save time by averting good maintenance procedures may cost more in the long run in lost computer time and data file reconstruction," the portfolio said.

The manual describes some events that have affected privacy in data processing such as the Fair Credit Reporting Act, the Privacy Act of 1974, international acts and future legislation and policy.

File security is also discussed from the standpoint that "good security is built on good procedures that are easy to follow and do not cause resistance from the people who must use them."

Touching briefly upon audits, the manual recommends they be used "to improve the operations function and . . . accomplish such things as validating the usefulness of present systems, identifying reports that might be eliminated, initiating a frank discussion of user complaints and reviewing the efficiency of operating and data procedures."

Finally, the manual examines the requirements and selection of a DP site including building specifications.

"Data Center Operations Management" is available at the subscription price of $150 per year. In addition to the manual, subscribers to the series receive bimonthly supplements of four portfolios each that are revised on a continuing basis.

Auerbach is at 6560 N. Park Drive, Pennsauken, N.J. 08109.

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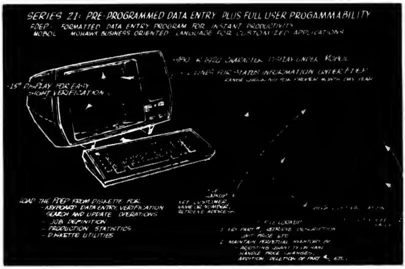
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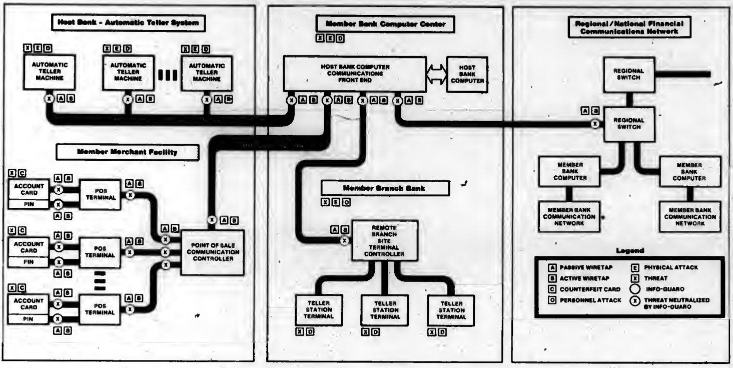

This Motorola illustration shows how Infoguard can protect an EFT threat environment.

Motorola Brings Out Encryption Hardware Line

(Continued from Page 49)

works with Digital Equipment Corp.'s PDP-11 minicomputers, fitting in one standard peripheral slot. The DES1100 board includes storage for encryption data, address-select logic, direct memory address (DMA) logic and three registers for control, status and data transfer.

Other Devices Forthcoming

The NSM, PEM and DSMs are available now, while another group of Infoguard products will be available in the second quarter of 1978, a Motorola spokesman said.

The forthcoming group of products includes the factory-programmed DES4100, DES4200 and DES4300 devices. The DES4100 and -4200 are tabletop units differing from each other in method of key entry, whereas the -4300 is a rack-mounted device delivering one to 16 data channels, the spokesman said.

The DES3100 NSM is priced at $3,000 per unit and the DES2400 PEM at $250 per unit in quantities of 1,000, the spokesman said.

The MGD6800 and -8080 DSMs are priced at $475 and $495 respectively in quantities of one to four; the custom DSMs cost $300 per unit — depending on the configuration for which they are designed, he said.

The DES1100 DSM costs $1,995. The DES4100, -4200 and -4300 products will sell for $2,500 to $3,500 per unit, the spokesman continued, noting that the price will vary with options — in the case of the DES4300, according to the number of data channels selected.

Motorola is at 8201 E. McDowell Rd. Scottsdale, Arizona 85252.

Payroll Managed On-Line For Hospital in Two Places

(Continued from Page 55)

The hospital is also preparing for involvement in the federal pension reform act, according to Flynn. "St. Joseph's, as a church-operated facility, is exempt from the system at the time, but we are preparing for compliance when required in the future," he said.

Although hospital officials are confident of the accuracy and reliability of the computerized system over the traditional keypunched time card methods, they also retain a manual "backup system" for emergency use.

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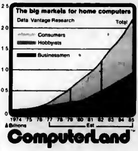

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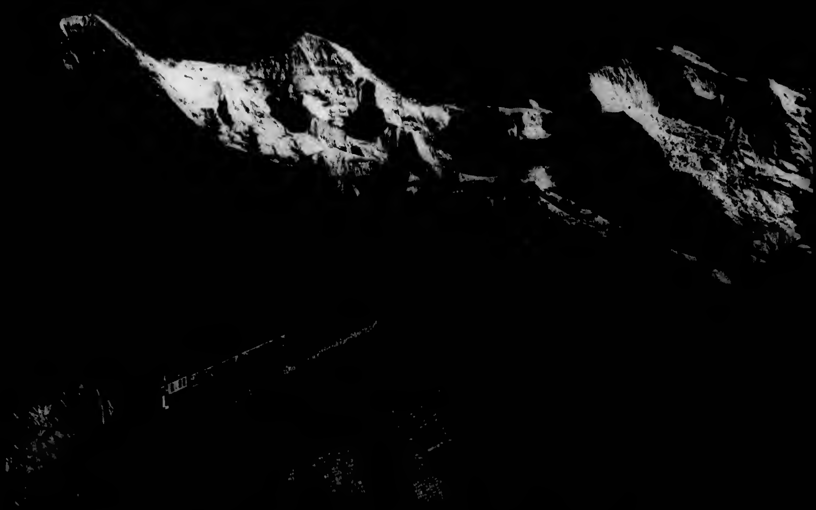

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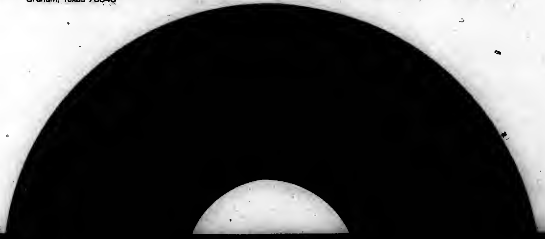

Talking to Mini Makers — Part 1

Support Problems Exist, Vendors Admit

By Esther Surden
CW Staff

Problems do exist with hardware maintenance and software support, a sampling of minicomputer vendors and small system makers admitted in recent interviews.

Most said they are working on ways to improve their services and make operations easier for their users.

Not all of the vendors were as blunt as Basic/Four Corp.'s director of marketing support, Chuck Muhle, who said, when asked what users should be able to expect from his system, "Users should expect a trouble-free operation."

Many, including Muhle, whose system was designed for first-time users, pointed out operations would be less troublesome if users took the time to get as much training as possible on their systems. As Muhle stated, "What is installed should not be asked to do what it was never intended to do."

Mike Snyder, manager of customer technical services at Computer Automation, Inc., concurred with Muhle. His firm deals with highly sophisticated users who have worked on many minicomputers.

"A problem is convincing the users to come to training classes. We can cut development time if we can get them to the training classes first, but many users feel they know enough about the systems" because they've worked on similar machines from other vendors. The two or three weeks spent on training would be well worth it, he said.

Users Misinterpret Guides

Since "most problems at the first level are misinterpretations of our users' guides," users have to read users' guides and documentation very carefully, according to Bill Swanson, director of software operations at Datapoint Corp.

The most common cause of trouble at user installations is an old story, according to Data General Corp.'s Steve Gaal, manager of systems engineering: "People don't have time to do it right, but they have time to do it over."

Users are reluctant to invest the money to send their people to training classes, he contended.

One way to avoid problems during the development stage is for the user to carefully examine how he is going to approach each problem in a "nonstressful environment" — without the system — before development actually begins, he said.

The vendors interviewed recognize the need to have reliable working conditions, especially when interactive systems are being used. Having realistic expectations is one way to ensure success, Bill Krause believes. Krause is marketing manager for Hewlett-Packard Co.'s 3000 Series II system.

"I think it's unfair for a vendor to set a user's expectations to expect a trouble-free operation," he said. But "we put the same emphasis on support as we do technological design."

In July, Computerworld *asked readers to tell us what they thought about minicomputers by filling out and returning a survey form. The results of that survey, published in August and September issues, showed support and maintenance were areas of great concern to users.*

Beginning this week, a series of articles will attempt to fill users in on what vendors say they are doing to alleviate some of the problems in those areas.

Based on interviews with a random sampling of minicomputer and small systems vendors, the series will cover various issues of concern to users.

In order to assure a relatively trouble-free operation, a user should try to clarify what the vendor's responsibility will be in both hardware and software support and what his own responsibilities will be, Krause advised.

He suggested the user next evaluate the vendor's ability to meet its responsibilities by looking at its service force and commitment to that force, then make sure the services offered meet his needs.

Since there will probably always be bugs, Krause said, the user should make sure the vendor has a defined procedure for bug fixing and "test that procedure by talking to other users" to ensure it works.

The interactive environment is a critical environment, Microdata Corp.'s president Donald Fuller noted, because usually there are no alternatives to doing a job. If the minicomputer goes down, the whole operation goes down and the customer can't do business, he noted.

Although Fuller would not say this will never happen with his system, he did point to ways it could be avoided. "We use a four-

(Continued on Page 62)

First ARC User Expects System To Ease Managers' Headaches

By Esther Surden
CW Staff

NEW YORK — What are some of the problems confronting a management that supervises several discrete small systems running different applications within a company?

One of the major problems is getting time for development work, according to Fred Winograd, vice-president of Chase Manhattan Bank here; another is providing backup for critical applications and a third is finding economical upgrades.

The bank is one of the first users of Datapoint Corp.'s recently announced Attached Resource Computer (ARC) system, [CW, Dec. 5] which should, when fully implemented, provide a solution to these problems, Winograd said.

Chase also uses a lot of other small systems and minicomputer equipment, communications gear, terminals and mainframes from various vendors. The primary reason for Chase's choosing any small system is to provide a solution to a problem.

The ARC system is basically a method of linking several functionally dedicated processors along a common bus so they act together as a system with a common data base.

CW Photo by E. Surden

Under Chase's raised floor, the Hub box helps link Datapoint systems.

A Datapoint user for about a year, the bank recently installed the ARC internal network. Presently only back-office data entry functions are being run on ARC for testing purposes and to make sure the system is secure, but the system is working well, Winograd reported.

The systems linked to ARC are scattered

(Continued on Page 62)

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First User Sees ARC Providing Three Solutions

(Continued from Page 61)

on the fifth, seventh and eighth floors of Chase's Lower Manhattan building. Only five systems are presently hooked into ARC, but more will be soon, he said.

The system is expected to alleviate all of the problems Winograd mentioned. With ARC, it will be unneccessary to devote complete systems to development work.

When development work must be done, the programmer can sit down at an inexpensive processor that does not have any disk storage directly related to it and search the system to find where pieces of free storage are available. Using that information, the programmer can logically configure a system.

Demonstrating the system's capability, Winograd noted it doesn't matter to that programmer where the, disks are physically located since there seems to be no degradation in response time.

Backup Solution

Solving the system backup problem is another function the ARC net is expected to do for Chase. The bank runs a number of critical applications that must be backed up.

Because of the ease of reconfiguring a system, processors can be swapped in and out with very little effort, Winograd said. If a file processor fails, the disks can be removed and hooked to another ARC processor; if an applications processor goes down, the user can move to another applications processor operating in a less critical mode and continue processing.

Other methods require duplication of hardware, wasting the system's resources with idle machines waiting for breakdowns, he indicated.

Another area of concern to the bank is system upgrades. "As soon as you get any system in, there are 14 more that need to be done," Winograd commented. In most cases, an upgrade requires ordering new equipment that takes time to come in and software changes, which are costly.

Using ARC, the bank expects to save its software investment in Datapoint equipment while being able to upgrade in a modular manner. It will be able to swap in new processors with little change to the system, Winograd said.

"It's much more economical to put in a minimum configuration and build in little pieces if it can be done without changing any code," he explained.

When Chase first became ARC's test site, Winograd recalled, very little new equipment was rolled in. The only equipment required were the Resource Interface Module (RIM) boxes, a Hub to connect the RIMs and coaxial cable. It looked as though the bank was getting cable TV, Winograd recalled.

CW Photo by E. Surden

The RIM box fits on the back of the Datapoint system, interfacing the system with the ARC network.

The cable was run under the floor without disturbing normal operations, he said.

"The whole extension requires four new commands and no reprogramming," he noted. "Training came out of the regular Databus users manual."

In fact, the system was so new that no documentation was available for it, but it still went in smoothly, he added.

Vendors Admit Support Hard

(Continued from Page 61)

hour response time as an actual must" for hardware, he said, "and we make sure we have a service office within 50 miles of a machine.

"It's extremely bad for a customer to cajole a manufacturer" into providing a machine if a service office is not close enough, he added.

Systems have room for improvement in reliability, he said, with self-diagnostics and error correction and logging techniques designed into the minis.

Users should be aware that those manufacturers surveyed all agreed they can't expect a bug-free system. "There's no way in the world you can put out a bug-free package," Microdata's Fuller cautioned. "Expect bugs.

Digital Equipment Corp.'s Henry Spencer, software servics marketing manager, agreed. "It's impossible to get a piece of software completely bug-free," he said.

The crux of the matter, according to General Automation's John Appel, director of field service, is that software is not as easy as hardware to control. Software cannot be tested in the exact atmosphere in which the user is going to use it, he pointed out.

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RDA Teams LSI-11, Disk

BELTSVILLE, Md. — RDA, Inc. has teamed a Digital Equipment Corp. LSI-11 microprocessor with an integrally mounted dual microfloppy disk subsystem that features up to 205K bytes of storage, 64K bytes of random-access memory (RAM), four serial interfaces, two quad expansion slots and a power supply in a desk-top enclosure.

Said to be compatible with the DEC RT-11 foreground/background operating system, the system reportedly supports a macro-assembler, Fortran IV, multiuser Basic, APL, Focal, Forth, Pascal, SAL 11 and Minbol.

An RD-11C with 8K bytes of RAM, dual microfloppies and a serial console interface costs $4,595 from RDA at 5012 Herzel Place, Beltsville, Md. 20705.

Accountants Gain Turnkey

SANTA ANA, Calif. — General Information Systems, Inc. (GIS) has developed a hardware/software turnkey system for use by accountants and corporate financial officers.

The system, designed to generate reports, journals and ledgers for these users, allows individualized reports to be derived from any chart of accounts, the firm said.

Based on user needs, reports can be generated in dollars as well as nonmonetary units such as gallons of gasoline or product units. Payroll recording and analysis can also be performed, a spokesman noted.

Communications with the system is through a special language dubbed "The Accounting Language," said to be easy for accountants to learn.

The system offers standard balance sheet; statement of changes in financial position; changes in working capital; working trial balance; detailed general journal; detailed general ledger; and a list of payroll check entry reports, the company noted.

A typical system based on the Digital Equipment Corp. Datasystem includes a PDP-11/03 CPU with 32K bytes of memory, one removable disk with 2.4M bytes and one 4.8M-byte fixed disk, a CRT, 180 char./sec printer, operating system, GIS Able software, installation, 20 hours of training, a six-month software warranty and a 30-day hardware warranty. It costs $33,995.

GIS is at 2024 N. Broadway, Santa Ana, Calif. 92706.

Graphics Unit Built on Micro

SCOTTSDALE, Ariz. — Terak Corp. has introduced a stand-alone, table-top system featuring raster-scan graphics capability.

Based on the company's Model 8510, the 8510/A graphics computer system includes the Digital Equipment Corp. LSI-11 microcomputer, a single floppy disk drive and controller to handle up to four drives, 56K bytes of read/write MOS random-access memory, single asynchronous serial interface, video electronics, 12-in. CRT and keyboard.

Graphics are displayed in bit-map fashion using a 320-dot wide by 240-dot high matrix refreshed from any contiguous segment of main memory, the firm said. Text is displayed as 24 lines of 80 characters each from a randomly addressable page buffer.

Text and graphics are independently controlled, including three horizontal blanking zones in each mode of display. Text and graphics can be displayed simultaneously since dot matrices overlap yet are visually distinct, the firm claimed.

The 8510/A is supported by a disk operating system. Languages available include Macro-Assembler, single and multiple user Basic, Fortran IV, APL and Pascal.

The hardware system costs $7,850; software is priced separately, the company noted from Suite 100, 14425 N. Scottsdale Road, Scottsdale, Ariz. 85260.

System Handles Laboratory Data

HARTFORD, Wis. — General Robotics Corp. (GRC) has announced the LAB/X3 laboratory data acquisition system based on its 11/X3 system.

The 28K-word Digital Equipment Corp. LSI-11 microcomputer system has 16 channels of 12-bit analog-to-digital conversion, with a throughput of 35 kHz, and two channels of 12-bit digital-to-analog conversion.

A crystal-controlled programmable real-time clock is provided for control of sampling intervals, GRC said.

The system uses a dual-drive, double-density flexible disk subsystem. Total data storage reportedly exceeds 1.2 Mbytes and transfer rates are as high as 500,000 bit/sec.

Software provided includes the DEC RT-11 operating system, Ansi-standard Fortran IV, the Scientific Subroutine Package and Labdac, a set of Fortran-callable subroutines for data acquisition and control.

System options include a graphics terminal with software for full vector graphics capability, a 20M-byte cartridge disk subsystem, time-sharing software, APL, Basic, Multiuser Basic, CRTs and hard-copy terminals.

The standard configuration, which includes a one-year warranty, is priced at $14,940 from the vendor at 57 N. Main St., Hartford, Wis. 53027.

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A multiple choice quiz on Keybatch.

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(WARNING: there may be more than one right answer to each question)

---

1. Keybatch is:

(a) a multifunction intelligent key-to-disk data entry system.

(b) a brand new multifunction system from Data 100.

(c) a multifunction system which supports high volume concurrent batch capabilities.

2. Keybatch is also:

(a) a multifunction system offering stand-alone RPG for expanded user flexibility.

(b) a multifunction system that can operate with on-line file inquiry capabilities (3271 compatible) via common keystations for both data entry and on-line file inquiry.

(c) a system capable of handling mail sorting and other office tasks.

3. As a data entry system:

(a) Keybatch has up to 20 megabyte disk storage capacity.

(b) Keybatch is proven with approximately 900 units now in use.

(c) Keybatch can be configured with 2 to 16 keystations.

4. For the end user:

(a) Keybatch meets short range goals such as appreciable dollar savings.

(b) Keybatch provides for long range system growth.

(c) Keybatch offers both of the above.

5. For more information on Keybatch, you should:

(a) search frantically through your EDP literature files.

(b) write Data 100 at 6110 Blue Circle Drive, Minnetonka, MN 55343.

(c) call your nearest Data 100 sales office or one of the numbers we've listed.

Are you a multifunction expert? Check these correct answers.

All answers but four are correct.

1b: Keybatch isn't brand new, was introduced in 1974.

2c: Sorry, Keybatch can't do everything.

3b: There are actually 1500 Keybatch systems on the job worldwide.

5a: No need to search when we're so easy to write or phone. Do it now.

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Mini Eliminates File Duplication for University

Special to CW

OTTAWA, Kan. — Ottawa University here reported it eliminated redundant information in its records and hastened admissions and registration procedures when it installed a minicomputer.

With the system, it is now practical for the university to offer its students an extensive curriculum in computer languages. But the real benefits will become more apparent in the future as the system is expanded to handle more processing tasks, spokesmen for the university stated.

Ottawa University is a liberal arts school with a total enrollment of nearly 4,600 students, some of whom must register for courses five times a year.

The system was installed at the university's computer center in April 1976 and, according to Ottawa officials, has functioned 24 hours every day since then with almost no downtime except for preventive maintenance and system upgrade.

The system is based on a Data General Corp. Eclipse C/300 minicomputer with 192K bytes of main memory and an integral magnetic tape drive for backup purposes, 100M-byte disk drive and a spare disk drive.

It also includes several line printers, 10 CRT terminals, four hard-copy terminals and communications gear including modems and a DG asynchronous line multiplexer.

Supports Four Offices

Four of the CRTs are located in the administration department (that number will soon be expanded to six). Seven are available for student use in computer programming, mathematics, science and economics courses.

A dedicated telephone line connects the computer center to another terminal 55 miles away at the university's "College Without a Campus" in Kansas City.

The system was designed to address the information needs of the school's four primary offices: admissions, registrations, business and development, according to Dr. Justo Diaz, director of planning and analytical studies.

Since the installation of the minicomputer, Ottawa has automated the functions of and files maintained by the admission, registration and development offices.

Eventually the business office will also be connected to the computer center, Diaz indicated. All of the school's information will be maintained on a single data base, he added.

Unlike other universities which have two or a maximum of three registrations each year, Ottawa's 580 to 600 residential students as well as faculty and staff must undergo five registrations annually.

Before the system was installed to handle the registration procedure online through five terminals temporarily located at the registration site, the information on student identification, previous courses taken and grades and courses chosen by students for the present session were compiled manually and updated and maintained in up to seven different filing systems.

With the minicomputer system, the school eliminated some of those redundant filing systems along with an estimated 70 to 80 duplicates in the 4,000 records it kept, lead programmer Ron Dear recalled.

The system also has saved staff and students alike much time. All of the information on admissions and course registrations is now up to date, according to Dr. Spencer Martin, the former director of the university's computer center.

Before installing the minicomputer, the admissions cycle had been burdened with processing data on 5,000 to 6,000 students manually.

With the Otis software, the Ottawa staff saves time looking for and updating files and sending out the updated information to students and faculty because course registrations information is gathered at the registration site.

In addition, it has reduced errors — how many the university does not know.

"Inaccuracies stuck out like a sore thumb when information was compared on the system's CRT terminals," Martin said.

Now detailed information such as student identification, addresses, past courses taken, credits earned, grades and present courseload — and, in the case of women who married after graduating, their married and maiden names — is maintained in one filing system.

Other Systems Considered

Ottawa examined different systems including a Digital Equipment Corp. PDP-11 and IBM System/3 before installing the one it now has. "We never had a computer, so we had no preconceived notions about how it would fit into the Ottawa University scheme," Martin said.

"The IBM system really didn't meet our specs," Diaz added. The DG system was chosen because of its file management capability and the ability to process data in foreground and background, he said.

The system's ability to handle data in two distinct areas of memory ensures that administrative and educational operations are separately maintained.

"I've been in this business too long to take a chance with the security of administrative data," Martin explained. "If anybody can access and alter data, a student will be the first one to find out how."

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Unit Built for Wholesalers

EL SEGUNDO, Calif. — Compusource Corp. is offering a turnkey minicomputer for wholesale distributors.

Based on the Data General Corp. Nova or Eclipse, the system includes a multiple independent workstation capability and runs under DG's RDOS operating system.

Up to 64 CRTs, 512K bytes of memory, 10M to 200M characters of disk storage and a selection of printers can be accommodated by the system, Compusource said.

Eight software packages are included with the turnkey system.

A system based on the DG Nova 3 with 64K bytes of main memory, a 10M-character disk, one CRT and a 300 line/min printer including all software costs $42,000 or $900/mo on a lease/purchase agreement. Compusource is at 2221 Rosecrans Ave., El Segundo, Calif. 90245.

DEC Adds PDP-8/T Line

MAYNARD, Mass. — A series of PDP-8 computer systems said to offer users up to 22% savings over standard prices has been announced by Digital Equipment Corp.

Called the PDP-8/T series, the systems incorporate standard peripheral and cabinetry configurations and a choice of PDP-8/A central processors.

The PDP-8/T3 incorporates a PDP-8/A central processor with 16K words of core memory a four-slot Omnibus expansion capability.

The PDP-8/T5 central processor has 32K words of core and an 11-slot Omnibus expansion capability. The PDP-8/T7 features 64K words of MOS memory and an 11-slot expansion capability.

All three configurations include a 1.6 million (12-bit) word removable disk cartridge drive and a 3.2 million word nonremovable disk drive, a Decwriter II terminal printer and a VT52 CRT with the RTS/8 real-time operating system and the OS/8 operating system as software.

The PDP-8/T3, T5, T7 are priced at $19,000, $22,000 and $24,500 respectively, from the firm in Maynard, Mass. 01754.

Small System Streamlines Growing Firm

By Larry Mason

Special to Computerworld

EL MONTE, Calif. — Many firms are standardizing and streamlining their DP and management activities using small systems. A case in point is Cetec Corp., a miniconglomerate headquartered here that manufactures electronics including broadcast equipment, component supplies, marine and computer products and plastic extrusions.

Realizing rapid growth without the proper management controls can bring with it a number of problems such as a lack of communications among the divisions; repetition of certain tasks and overall inefficiency, the company was reorganized into 12 independent profit centers with a mutual data base so each division manager has all the knowledge he needs to handle his operation.

At the same time, this organization provides a common source of information for the entire company with data only entered once.

System Doubling Planned

In order to accomplish this, the firm has installed four Basic/Four Corp. small business computers; future plans call for the addition of four more systems. While there were a number of reasons for choosing this particular manufacturer, one of the primary advantages to the small systems is their interactive capability.

If a user has to rely on a service bureau or batch processing for data processing, chances are the information is out of date by the time he has access to it. With an interactive system, the output is as current as the last transaction. All management decisions are made on the latest statistics.

Another major reason for selecting these particular systems was to minimize software expenses by standardizing the programs and the programming language throughout the divisions.

Range of Systems

Before the present systems were installed, Cetec's information systems varied from automated to manual. For example, the Sparta Division used a Honeywell 57, while the Benmar Division used an IBM System 3.

Typical of the situation was Moltronics, a distributor of electric components to industrial accounts with four locations in California and Arizona. This division used a manual inventory control and purchasing system with a combination of hand-posted records, cardex and bin cards.

Nine-part packing slip/invoice forms were typed on a Friden Flexowriter, then extended, journalized and posted to accounts receivable on an NCR 395 accounting system.

Moreoever, there was no common system either operationally or for accounting purposes at the four locations, so the end result was four independent businesses.

Past, Present Systems

The initial small business system at Moltronics was a Basic/Four Model 350 with one CRT, one high-capacity disk drive and a medium-speed printer for hard-copy reports, packing slips, invoices and checks. Since that time Moltronics' sales volume has doubled and the system upgraded to a Model 500 with three high-capacity disk drives, three medium-speed printers, five CRTs and a communications interface. User memory is 48K bytes with 12.6M bytes on-line storage.

The current configuration has a CRT located in the Moltronics San Diego facility and one CRT and printer at both the Phoenix and Santa Clara locations, while the CPU, disk drives, printer and two CRTs are at the main plant in South Gate, Calif.

A line is reserved 24 hours a day for on-line, real-time inventory stock checks and order entry.

In addition to performing order entry and controlling inventory, the business functions currently handled by the systems include bill-of-material processing, material requirements planning, job costing, sales analysis, accounts payable and receivable and payroll.

Mason is corporate consultant to Cetec Corp.

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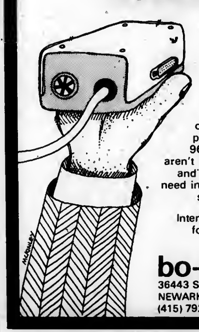

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Kit Turns IBM Selectric Into Terminal

PLEASANT HILL, Calif. — Escon has introduced a kit which can reportedly convert an IBM Selectric typewriter into a hard-copy output terminal without the need to drill holes or make extensive modifications.

The terminal is compatible with most computer systems that utilize the S-100 bus interface, according to a spokesman.

The converter, Kit E-T, consists of a single Ascii-coded card utilizing parallel output, mechanical conversion parts, solenoids and an instruction manual.

A status byte indicating completion of the operation is provided, with polarity and position determined by the user, the spokesman said.

An optional power supply provides 30 Vdc and includes a capacitor and driver power transistors to operate the solenoids, he added.

The converter is available for $455 in kit form and $695 assembled. The optional power supply is priced at $60 in a kit and $130 assembled from Escon, Suite 204, 171 Mayhew Way, Pleasant Hill, Calif. 94523.

I/O Subsystems Designed for TI Micro

NORWOOD, Mass. — A series of six analog I/O subsystems that are compatible with Texas Instruments, Inc.'s TM-990/-100M 16-bit microcomputer has been introduced by Analog Devices, Inc.

The RTI-1242 provides up to four channels of 12-bit analog output and eight high-current digital outputs for driving peripheral devices, the firm stated.

The RTI-1243 is similar in design except that it offers eight channels of analog output.

Features of both units include a single 10V reference for all channels or for external use; an option for readback of the digital-to-analog conversion and driver data for software efficiency; an independent range and code selection allowing any of five output ranges and three input codes for each channel; and address selection via a solid wire DIP switch or jumper plug, according to a spokesman.

The RTI-1240-R has an instrumentation amplifier with a gain that is selectable by a resistor and that provides up to 32 single-ended on-board input channels expandable to 256 channels using on-board logic, the spokesman said.

The RTI-1241-R has the same features but includes two 12-bit digital-to-analog converters.

The RTI-1240-S is similar to the 1240-R and 1241-R except that its amplifier gain is programmable through software, the spokesman noted. The RTI-1241-S is also programmable and also features two 12-bit digital-to-analog converters, he said.

The RTI-1242 and 1243 cost $395 and $675, respectively.

Prices for the RTI-1240 and 1241 models begin at $445. Analog Devices is at Rt. 1 Industrial Park, P.O. Box 280, Norwood, Mass. 02062.

Comes in Two Versions

Z-80, 8080 Get Floppy Controller

SAN JOSE, Calif. — Computer Hobbyist Products, Inc. has introduced a floppy disk controller board it said is compatible with S-100 bus Z-80 or 8080 microcomputer systems.

The FDC-108 is available in two models, one for minifloppy drives (5.25 in.) and one for standard drives (8 in.).

The board features an eight-drive capability, jumper-selectable addresses, IBM 3740 soft-sector format compatibility and an on-board crystal controlled clock, a spokesman said.

The unit has a 1K-byte programmable read-only memory (Prom) and a jumper-selectable wait state for 4mHz operation, he added.

Software routines include a boot to bring the system up without dependence on other hardware or software; a blank disk format program that allows salvage of "bombed" disks; and various programs for software customization, the firm said.

Assembled and tested, the controller board costs $400. A Basic kit which includes a printed circuit board, large-scale integration controller chip, programmed IBM 2708 Prom and documentation is available for $225.

Computer Hobbyist Products can be reached at P.O. Box 18113, San Jose, Calif. 95158.

PCM-12 Gains Two Boards: CRT Link, PDP-8 Emulator

SAN RAMON, Calif. — Two interface boards for use with its PCM-12 microcomputer system have been announced by Pacific Cyber/Metrix, Inc.

The 12060 interfaces the PCM-12 to any teletypewriter or CRT terminal. The unit uses Digital Equipment Corp.'s device codes 03 and 04 and provides inputs and outputs for both the 20mA and RS-232 signaling levels.

Other features include user-selectable transmission rates from 110-to 9,600 bit/sec and programmable one-stop-bit or two-stop-bit operation, a spokesman said.

The 12310 is a TTL-level interface module that is said to execute for the PCM-12 an instruction set identical to that which DEC's DR8-EA module executes for the PDP-8/E.

It provides the 12-bit parallel I/O control capability necessary in data collection and control applications, the firm claimed. Two 26-conductor ribbon cables supply all external connections.

The 12060 costs $97 as a kit and $167 assembled. The 12310 is priced at $138 in kit form and $215 assembled. Pacific Cyber/-Metrix is located at 3120 Crow Canyon Road, San Ramon, Calif. 94583.

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3270/3790 Users:
Why wait for 3274s or 3276s? Raytheon's PTS/1200, the highly i does much more. And you can get i

Waiting for the next new product advance can often make a lot of sense. Unless there is an immediately available alternative that has far more capabilities and can produce far greater cost savings and productivity benefits.

Raytheon's PTS/1200 system is such a product. It is a fully-programmable distributed processing system that uses an easy-to-use English-language compiler, has a main memory capacity of up to 128K bytes, handles up to 32 operator displays—*plus* dozens of additional downline displays in a multipoint network control mode—and can have a large peripheral equipment complement and local data base as well.

And the PTS/1200 operates in a fully compatible mode with IBM 3270 operator display devices. It not only emulates every 3270 function, but it performs total batch processing and spooling functions as well—simultaneously—and with no degradation in response times in either interactive or batch mode.

If you are waiting for the next 3270-type product to come on the market, wait no longer. For the PTS/1200 is far more powerful, cost efficient and adaptable—in a 3270 environment—than any product you can find today. And you can take delivery in just 30 days.

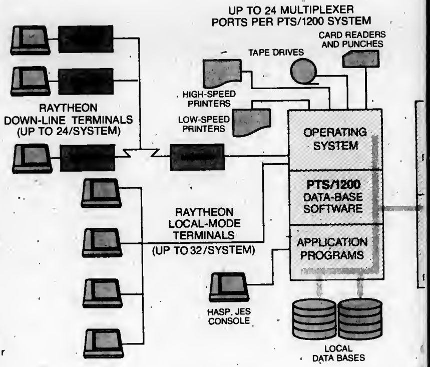
Look at what else the PTS/1200 can do for you:

- ✓ Operate in full 3270-compatible mode
- ✓ Control up to 32 operator displays
- ✓ Perform local batch processing concurrently with 3270 interactive processing
- ✓ Attach up to 24 peripheral devices
- ✓ Attach a large local data base
- ✓ Perform all 3270-type data entry tasks
- ✓ Perform all 3270-type inquiry/response tasks
- ✓ Operate as a HASP/JES workstation at the same time it is performing 3270 emulation
- ✓ Perform multiprogramming functions
- ✓ Control, in addition, a multipoint network of up to 24 terminals in 3270 mode.

Consider these five benefits, and you'll look a lot harder at the PTS/1200.

No Change To Host Processor

The PTS/1200 installs immediately within your existing network with no change required in your host CPU, in the 370X front-end, in your existing applications software, or in your Emulation Program. It goes to work under 3270 bisynch protocol the day you install it.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LOCAL DATA BASES

2 Cut Mainframe Overhead

The enormous power of the PTS/1200 permits you to develop and store local formats and perform advanced data editing prior to transmission to the host CPU. This one feature alone can reduce your mainframe overhead by 30 per cent or more. The PTS/1200, in addition, runs its own multipoint network of up to 24 Raytheon terminals in 3270 mode—saving even more CPU time.

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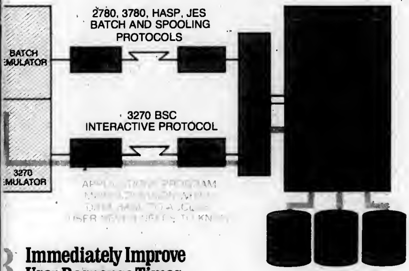

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D

DATA FORMAT — Rules and procedures describe the way data is held in a file or record, whether in character form, as binary numbers, etc.

DEBUG — 1. An instruction, program or action designed in microprocessor software to search for, correct and/or eliminate sources of errors in programming routines. There are many types of "bugs" or "glitches" that can be located by single-step testers, specifically designed programs or operational procedures. 2. To locate and correct any errors in a computer program. 3. To detect and correct malfunctions in the computer itself.

DEGAUSS — A procedure to demagnetize a magnetic tape. A degausser is a coil that is momentarily energized by an alternating current that disarranges the impulses on a magnetic tape when it is placed close to the coil.

DIAGNOSTIC — Refers to the detection, discovery and further isolation of a malfunction and/or mistake.

DIGITAL — Refers to the use of discrete integral numbers in a given base to represent all the quantities that occur in a problem or calculation. It is possible to express in digital form all infromation stored, transferred, processed or transmitted by a dual-state condition (i.e., on-off, true-false and open-closed).

DIGITIZE — A process which is used to convert an analog measurement of a specific physical variable into a number expressed in digits in a system of notation.

DIP (DUAL IN-LINE PACKAGE) — 1. The most popular IC packaging in the mid-1970s in the plastic, dual-in-line case, using plastic for economic reasons and the dual-in-line package (DIP) configuration for manufacturing efficiently. 2. Chips are enclosed in Dual In-Line Packages which take their names from the double, parallel rows of leads which connect them to the circuit board. DIPs are sometimes also called "bugs."

DISK OPERATING SYSTEM — Many such programs are data communications-oriented, disk-based operating systems. They feature both multiterminal and multitasking capabilities and allow full control of both hardware and software operations through the system console, or any batch input device.

DISK PACK — Refers to various removable direct access storage devices containing magnetic disks on which data is stored. Disk packs are mounted on a disk storage drive, such as the IBM 2311.

LEARNER'S LEXICON

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Teletype 33 ASR rebuilt $750. 33KSR rebuilt $395. 35 ASR used good $750. Dura Mach IO $225. IBM 745 $550. Lou Carbaugh, P.O. Box 398, New Cumberland, PA 17070.

Microsoft ("Altair") BASIC for 8080/Z80/6502 and FORTRAN IV for 8080/Z80 now available to OEMs, and users. 8080/Z80 BASIC has random, sequential files; double precision; IF ... THEN ... ELSE and more. FORTRAN produces optimized relocatable code, meets ANSI66 except complex. CP/M and ISIS-II BASIC or FORTRAN, off the shelf or custom versions. Microsoft, 300 San Mateo NE, Suite 819, Albuquerque, NM 87108 (505) 262-1486.

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Self-Contained Backgammon Set Uses 8048A

HOUSTON — A self-contained microcomputer-controlled backgammon game has been introduced here by Texas Micro Games, Inc.

Utilizing an Intel Corp. 8048A microcomputer, timing circuits and various I/O functions, the unit is able to analyze current board positions and use game theories and probabilistic methods to interact with a player.

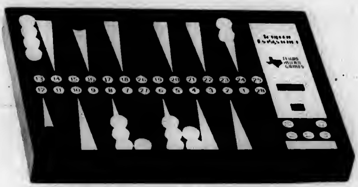
In traditional backgammon, a player's moves are determined by the roll of a set of dice. In this version, however, there are no dice; moves are dictated through the results of a simulated "dice" reading on a digital display. The display is activated by pushing one of six command keys used to control play, a spokesman said.

To begin the game and initiate board setup, a player touches the "start" button. The display will then show the word "roll." The player presses this button to determine who will move first. Moves are completed by depressing the "from" point first and then the "to" point.

When a player's move is complete, the display will say "roll," which the player performs for the computer. A random selection of dice values is assured by the inclusion of a number generator, the firm claimed.

The game features a "display" function that allows the player to verify each point has the correct number of pieces on it and an "update" button lets the player create a given situation to study strategy or to correct an error in moving pieces, the company added.

The game comes encased in a wooden frame and sells for approximately $200 from Texas Micro Games, Inc., 6230 Evergreen East, Houston, Texas 77081.



The game is operated with six command keys.

Hobby Havens

As a service to hobbyist readers, *Computerworld* periodically will list the micro clubs in different parts of the country. Clubs wishing to be included in this listing should send their name and address as well as the name and address or telephone number of a contact person to Frank Vaughan at *Computerworld*, 797 Washington St., Newton, Mass. 02160.

CALIFORNIA

South Pasadena SCCS. Contact: Greg Goldsmith, P.O. Box 987, S. Pasadena, Calif. 91030. Telephone (213) 682-3108.

Bay Area Microprocessor Users Group (Bamug). Contact: Tim O'Hare, 1211 Santa Clara Ave., Alameda, Calif. 94501. Telephone (415) 523-7396.

Calculator Lib. Contact: Gene Hegedus, P.O. Box 2151, Oxnard, Calif. 93034. Telephone (805) 486-7191.

Sonoma County Computer Club. Contact: Liza Loop, P.O. Box 945, Catati, Calif. 94928. Telephone (707) 795-0405.

CONNECTICUT

Southern New England Computer Society. Contact: Charles Floto, 267 Willow St., New Haven, Conn. 06511. Telephone (203) 562-4739.

DISTRICT OF COLUMBIA

Washington Amateur Computer Society. Contact: Robert J. Jones, 4201 Massachusetts Ave., Washington, D.C. 20016. Telephone (202) 537-1984.

HAWAII

Aloha Computer Club, Inc. Contact: George McOuat, P.O. Box 4470, Honolulu, Hawaii 96813. Telephone (808) 235-3585.

INDIANA

Purdue University Computer Hobbyist Club. Contact: Don Gille, Room 67, Electrical Engineering Building, Purdue University, W. Lafayette, Ind. 47907. Telephone (317) 463-2340.

IOWA

Quad City Computer Club. Contact: C.C. Fretwell, 2155 W. 30th St., Davenport, Iowa 52804. Telephone (314) 386-3723.

KANSAS

Computer Network of Kansas City. Contact: H.J. Schwartz, 7631 Broadmoor Lane, Overland Park, Kan. 66204. Telephone (913) 648-5410.

MINNESOTA

Advanced Technology Research Associates. Contact: Frank Stodolka, P.O. Box 456, Minneapolis, Minn. 55440. Telephone (612) 377-7387.

OKLAHOMA

Tulsa Computer Society. Contact: Mike Parr, P.O. Box 1133, Tulsa, Okla. 74101. Telephone (918) 581-3788.

TEXAS

The Computer Hobbyist Group of Northern Texas. Contact: The Secretary, P.O. Box 1344, Grand Prairie, Texas 75051. Telephone (817) 265-9054.

JSC Computer Hobbyist Club. Contact: Lonnie W. Jenkins, 1914 Wavecrest Lane, Houston, Texas 77062. Telephone (713) 488-4026.

Wire-Wrap Tool For 26, 28 AGW

BRONX, N.Y. — A battery-powered tool for wire-wrapping 26 and 28 AWG wire onto standard dual in-line package (DIP) socket terminals was introduced by the O.K. Machine and Tool Corp.

The tool features a built-in bit and sleeve for producing a modified-style wrap with the 28 AWG and a regular wrap with 26 AWG wire, the firm said. The tool weighs 11 ounces, runs on alkaline or rechargeable "C" size batteries and features a standard device to prevent overwrapping.

The pistol-gripped unit sells for $39.95 from the O.K Machine and Tool Corp., 3455 Conner St., Bronx, N.Y. 10475.

Application System Bows

NATICK, Mass. — An application system that utilizes the Z-80 microprocessor and is compatible with Control Logic, Inc.'s MM1 modular support boards developed for the 8080A was announced by the firm.

The MM1-ZCPU, using a bus structured system called Poly-buss, allows the customer to utilize either a Z-80 or 8080A MPU board with the same memory and I/O boards, the firm stated.

4K Eprom Capacity

The Z-80 microprocessing unit (MPU) board has a capacity for 4K of erasable programmable read-only memory (Eprom) plus 1K of random-access memory (RAM) and operates at a clock rate of 2 MHz.

Support boards are available for the MM1-ZCPU and include: 16K Eprom, 16K dynamic RAM, 4K nonvolatile RAM and 4K static RAM for memory supplementation. In addition, a wide range of I/O function boards are available, Control Logic said.

Software development for the system is supported by the Control Logic microcomputer development system (MDS), which has a complete floppy disk operating system with text editor, relocating assembler, linking loader and Fortran IV compiler, the firm said.

Price of the MM1-ZCPU board is $350 with delivery in 30 days from Control Logic, Inc., 9 Tech Circle, Natick, Mass. 01760.

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The schedule for the current Series ending in April is:
January 19, 1978, Orange County CA
February 2, 1978, Ft Lauderdale FLA
March 2, 1978, St Louis MO
April 4, 1978, Hasbrouck Heights N J
April 6, 1978, Valley Forge PA

The new 1978/79 ICC Series begins in September with Conferences scheduled for:
September 8, 1978, Newton MA
October 3, 1978, N J /PA area
October 5, 1978, Washington D C
November 9, 1978, Palo Alto CA

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Government Felt 'Conned'

IBM Exit From India Not Surprising

By Joseph Hanlon
Special to CW

IBM's forced departure from India ended a long and unhappy relationship in which IBM was increasingly accused of exploiting this most advanced of Third World countries.

Ten years ago, when I was still on the staff of *Computerworld*, a report that IBM was still selling 1401s in India was treated almost as a joke. In a recent trip to India, however, I found that far from being a joke, it was a source of bitterness to the Indians which led to IBM's being forced out.

The first commercial computer in India was an IBM 1401 introduced in 1961, and throughout the 1960s IBM completely dominated Indian computing. But it did so by importing used 1400 series computers at scrap value, reconditioning them and selling or leasing them at new prices. A large 1401 configuration was said to cost as much as $10,000/mo.

The massive profits on the 1401s were then used to pay for advertising, seminars and, according to some people, even bribes (although I saw no evidence of this) to further tighten IBM's grip on India computing. Resentment built as IBM oversold its computers on one hand but refused to import newer computers on the other.

'Height of Arrogance'

In what was seen by many as the height of arrogance, IBM proposed in 1970 to begin importing and reconditioning the then out-of-date 360 series. But the government said it would not be conned again and refused permission. It then increased pressure on IBM to sell half ownership to Indian nationals and to hand over servicing to the government service organizations set up in 1975.

IBM said no and pulled out instead. Considering the degree of bad will it had created, this was probably a wise decision.

IBM may have left, but its influence will remain. Of India's 350 computers, about 140 are IBM equipment. Most of these are 1400 series machines, but there is at least one 370/145 and a 370/155, the latter supplied as foriegn aid from Germany.

The second largest group of computers — nearly 100 — are from a government company, the Electronics Corp. of India Ltd. (Ecil). These were designed and built in India, although they resemble Digital Equipment Corp. machines. The TDC-2, first marketed in 1969, is similar to the DEC PDP-8, while the TDC-316, which has been sold since 1975, is similar to a PDP-11.

Although the Ecil computers reportedly work well, they are expensive — nearly three times more than their DEC counterparts.

Analysis

The major new entry into Indian computing is the Soviet Union, with at least 10 of its Ryad computers now installed. Users object to the fact that Ryad does not have high-capacity disk systems or fast tape and card units, but their low cost and the Eastern Block willingness to take rupees is a major advantage.

With IBM squeezed out, has anything changed in Indian computing? Critics inside India say no. They charge that computing retains its traditional business and accounting orientation, displacing clerical staff when India's biggest problem is a lack of jobs.

On the other hand, there is little use of computers in areas such as planning, where they could be of great use. Although the Oil and Natural Gas Commission now has an IBM 370/145, the Planning Commission still tries to do its modeling on an IBM 1620.

Ecil is also criticized for rushing out a Western-style computer without asking if that was the most suitable thing for India. Might it not have been more intelligent, for example, to concentrate on process control?

But things may, in fact, be changing. The government is taking an increasingly strong role in computer developments. Computer purchases now must be approved by the government.

And India is now building up an indigenous software capability. One large firm, Computronics, now advertises for Indian staff in U.S. newspapers and has brought about 20 Indian software specialists back.

IBM Works Out Pact to Retain 100% Control of IBM Indonesia

MT. PLEASANT, N.Y. — IBM has tentatively worked out an agreement with the Indonesian government that will allow a portion of the firm's business there to remain 100% under IBM ownership.

The move comes after the firm decided to close out its manufacturing, marketing and service operations in India. That decision was made after IBM refused to knuckle under the Indian government's demand for 60% ownership of the marketing and maintenance portions of the firm [CW, Nov. 21]. India permits foreign ownership only by firms whose total manufacturing output is for export purposes.

The Indonesian plan calls for IBM to appoint a trading agent which will be 100% Indonesian-owned. IBM will also provide technical assistance.

This rearrangement of IBM's structure in Indonesia will apparently satisfy the Indonesia law No. 6, passed in 1968, that requires foreign firms to transfer control of their sales and distribution functions to Indonesian agents by the end of 1977.

It is unclear as yet exactly what the purview of the future agent for IBM will be, according to a spokesman for IBM World Trade Americas/Far East Corp. here. The firm still has to work out a contractual agreement covering trading as defined by the law.

Employment opportunities will be offered to all IBM employees, the spokesman noted.

The current IBM presence in Indonesia, P.T. IBM Indonesia, is 100% owned by IBM and responsible for marketing and service. It will undergo a transition and emerge as a different entity, also owned 100% by IBM. Although the new entity will be smaller, it will have a substantial presence in Indonesia, the spokesman said.

IBM Indonesia was formed in 1937 and has experienced rapid growth recently, he said. Of IBM's 241 employees in Indonesia, nearly all are Indonesian and the firm offers a wide variety of products, he added.

While declining any specifics on a future agreement with a trading agent, the spokesman indicated there are many ways in which the IBM Indonesian operation can be divided.

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IBM Sparking Business for Add-On Makers

By Richard J. Egan
Special to CW

Independent memory manufacturers have been enjoying an unexpected boom in add-on memory shipments for larger IBM 370 mainframes because of the convergence of two recent IBM policies that have stimulated — and frustrated — users looking for more capacity in their mainframes during a period when many are converting to MVS.

Coming on the heels of the Series 30 announcement was the delivery stretchout of 370/158 and 370/168 memory. The mere presence of these newer, larger resident memory models has whetted the appetites of capacity-bound users.

At the same time, IBM has also begun to stimulate purchase of broader memory by users of the 370/158 and 168. In what we have come to call the IBM "suitcase policy," it appears as if IBM is currently embarked on a very active program of enabling 158 and 168 users to evaluate the need for expanded memory capacities.

IBM is doing this, our marketing intelligence suggests, by walking into a user shop with a suitcase containing up to 1M byte of memory cards. It offers to install the memory for a period of up to 30 days within the 158 or 168 CPU (which has built-in memory card cages).

After the 30-day period, the user can then judge for himself whether the need for memory is there. If it is, he can then order the additional storage.

The hitch is this: whether or not the user orders the memory, IBM removes the suitcase memory from his machine at the end of the trial period — and the user is told he must wait up to 12 months to add more memory to his CPU.

As an independent memory supplier, those two IBM strategies combine to provide a very interesting kicker to what has been a consistent and satisfactory level of demand for semiconductor memory at the high end of the 370 line.

In view of the price differential that exists between IBM memory and independent memory, the expectation is that additional volume will be forthcoming from IBM 158 and 168 users to independents as IBM works down the delivery of its larger Series 30 processors and the extension memories needed for current large 370s.

Gap Reopened

When IBM moved two years ago from 1K to 2K static MOS chips, that technological move was given as the reason for a major price reduction in its add-on memory. What has been — under core memory and early semiconductor memory technologies — a margin of 40% or more price advantage for the independents quickly narrowed to 20% or 30% or more.

But time has once again reopened the gap in pricing between IBM and most independent memory prices. Take the 168 memory, for example. When IBM went to 2K chips, it dropped its price per 1M byte to $110,000 — compared with what was then about $90,000 from the independents.

Independents have moved to the IBM-compatible 4K MOS static chips, which open up a price advantage by an additional 10% or 12%.

Recent improvements in packaging, the cost-effectiveness that comes from installing larger and larger modules and the need for less cabinetry, cabling, housings and other cost-related items because of better packing densities has enabled the independents to reprice again for an additional advantage. The result: a spread that approximates 45% again.

Cambridge Memories, Inc. several weeks ago, for example, announced a 9% reduction in 370/168 memory prices, bringing a typical 1M-byte memory module down to $68,200.

The real economic advantage comes, however, when the user considers larger memory buys because of the packing densities and other manufacturing economies mentioned above. IBM memory is priced at about $110,000 per 1M byte and is not improved by memory capacity or larger-quantity purchases.

Independent memory is housed outside the mainframe, with up to 8M bytes storable within a single housing. While 1M byte may cost $68,200, 4M bytes might cost $250,000 or $62,500 per 1M byte.

In addition to this major and escalating price differential, large-scale IBM users are also becoming increasingly aware of several other factors that distinguish today's add-on memory suppliers from the equipment vendors of five or six years ago.

Built-In Safeguards

Some users' earliest experiences with add-on memories came in 1970 and 1971 when IBM first gave tacit and then written approval for installation of "foreign" memory on 360 mainframes. The initial risk was one of IBM nonsupport of processors with independent memory attached.

Over the years — memory being memory — the value-added factors supplied by memory companies came in a variety of subtle ways, from memory expansion beyond IBM's rated limits to, most importantly, an entire hierarchy of memory system safeguards that gave nearly absolute assurance to the user that he could recover from, if not prevent, memory failures.

Features such as reconfiguration switches, off-line switches, the addition of memory exercisers, maintenance panels, auto power-on, auto IPL and IMPL, buffer management systems, DAT compatibility, "circuit-capture" techniques, single and multibit error recovery aids and built-in automatic memory port extenders are just a few of the technological enhancements that memory suppliers have added to their products in addition to the improved memory chips themselves.

The goal of these enhancements is user peace of mind. Memories are not likely to encounter the failure rates of electromechanical subsystems, for example. They are virtually all electronic and usually extremely well-tested before shipment, and they are supported with expert field engineering.

In almost every case, the cumulative effect of these features is to provide far more memory capacity than is available from IBM, and with uptime rates that typically exceed 99.85%.

Thus, while IBM is promoting more memory capacity and, at the same time, denying its immediate availability, the independent manufacturers are once again at the point of offering their maximum advantages in terms of price and performance, but with the added bonus of delivery and installation in as few as 30 days.

Egan is executive vice-president at Cambridge Memories, Inc.

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Contracts

International Communications Corp. has signed an agreement with Toshiba of Japan to supply modems under an OEM contract.

Qume Corp. has received a $5.6-million order for its high-speed daisy-wheel character printers from the Information Product Division of A.B. Dick.

Sycor, Inc. has signed a purchase agreement with Datamation Associates for 50 Sycor 350 intelligent terminals valued at more than $800,000 for use in custom service operations.

Digi-Log Systems, Inc. has received a $1,800,000 order from Western Union Data Services for additional micro-computers-based intelligent terminals to be used by subscribers of the firm's stored mailgram service.

Docutel Corp. has been selected to supply bank equipment to Western Bankcorporation (WBC), a Los Angeles holding company.

Honeywell has been awarded an 8-year contract valued at $13.9 million by the Internal Revenue Service. The contract covers hardware, maintenance, systems support and supplies.

Rolm Corp. has received a $16.5 million contract for its AN/UYK-19 computer from Raytheon for the U.S. Navy.

Honeywell has received a renewel of its OEM agreement with Industrial Nucleonics Corp. of Columbia, Ohio for Level 6 minicomputer systems.

The Pertec Division of Pertec Computer Corp. has signed a 2-year contract valued at $500,000 with the Paradyne Corp. of Florida for Pertec's T8000 tape drives for used in the PIX computer system.

International News

Sites Grew by 11% in '76

Study Sees Israel Leading Middle East Industry

By Bohdan O. Szuprowicz
Special to CW

While the Sadat-Begin dialogue is focusing world attention on the Middle East again, it seems like an opportune moment to look at the computer industry in that part of the world.

On the assumption that stable peace would eventually come to that troubled region, an interesting vision of the growth of computerization of the area was presented in the early 1970s by a study of the "Middle East in the Year 2000," published by the Association for Peace of Tel Aviv, Israel.

The study was widely publicized in the Middle East in 1971, but it received at best only a mixed reception in Arab countries. Some resentment was generated by the fact that it was unilaterally developed by Israel and that it singled out Israel as the leading scientific and high technology country in the area.

The study proposed that Israel should continue to stress development of electronics, computers and medical industries and become a leading supplier of such products and services in the area as a whole.

Other Countries' Role

Egypt would concentrate on engineering, steel and motor vehicle production, Syria would specialize in food processing and textile industries, Iraq and the Gulf States would continue in petroleum extraction and petrochemical production and Lebanon would play its traditional role as provider of banking, trading, shipping and communications services to the region.

The choice of Israel as a major electronics, computer and high technology products supplier in that part of the world is logical. Israel is not well endowed with natural resources and is facing a heavy import bill every year.

Technical Resources

It is best suited to play a role of a designer and manufacturer of high technology equipment such as computers, instruments or even aircraft and communications satellites, which call for a small amount of raw materials but require a high input of skilled labor and technical management.

At the end of 1976 there were 529 computers operating in Israel's civilian sector, according to the "Electronic Computers Survey 1977" published by the State of Israel Prime Ministers Office Central Bureau of Statistics. At least another 30 to 50 installations are believed to exist in the military and defense establishment.

There are today and there have been from the outset more computers in Israel than in any other country in the Middle East, including Iran, which is industrializing rapidly.

According to the "Middle East in the Year 2000" study, as many as 5,000 computers are envisaged in Israel by the end of the century. It is expected to remain the leading computer-using nation, far ahead of the 3,000 computers projected in Egypt and the 500 installations which Lebanon is expected to have at that time.

Recent Growth Rate

Israeli computer installations increased in 1976 by 11% over the previous year, although minicomputer installations showed a slightly faster growth of 12%. Of the total 529 machines in operation, 357, or just over two-thirds, are minicomputers.

It is also estimated that about a third of all the computers installed in Israel are produced domestically by the Elbit and Elcint minicomputer manufacturers.

Design and construction of electronic computers is not new to Israel; in fact, it began as long ago as the early 1950s. The first Israeli-designed computer, known as the Weizac, went into operation at the Weizmann Institute of Science in Rehovot in 1954.

Since then the Golem A and the Golem B scientific computers, comparable to Control Data Corp. 6600 machines, have been designed by the institute for internal use.

Joint Venture

In 1967 Elbit Computer Ltd. was formed as a joint venture of the Israeli government and the Elron Electronic Industries Ltd. It has since become the largest computer equipment manufacturer in Israel and is estimated to supply at least 20% of all the computers in the country.

The basic product was originally the Elbit 100 minicomputer, but in 1970 CDC became associated with the Israeli manufacturer and Elbit designed and built the CDC System 17 minicomputers in 1973 for domestic as well as export markets. Up to 50% of Elbit products have been exported in certain years.

Elta Electronics is a unit of Israel Aircraft Industries Ltd. and has been manufacturing Eltaterm 8504 LSI microprocessor-based computer terminals, which have also been designed with the domestic as well as export markets in mind.

Several other manufacturing operations in Israel produce a number of peripherals primarily designed for domestic consumption. These include 6.4M-bit minidisk memories, paper tape readers, high speed readers, data input devices, verifiers and data communications equipment such as modems.

Several Israeli manufacturing firms are also engaged in production of electronic components such as integrated circuits, transistors and other elements.

Matter of Necessity

Israeli computer and electronic manufacturing industries were developed out of necessity in order to save foreign currency and limit imports. As a result, Israel is at present the most advanced computer manufacturing country in the Middle East, with basic all-round capabilities in design and production of CPUs as well as peripherals, which can be expanded to accommodate larger markets.

More important perhaps is the fact that such an industry requires a certain nucleus of trained software developers and designers which are critical to the establishment of a viable computer industry. From that point of view, Israel is particularly well qualified to take the lead in further dissemination and introduction of information processing in the Middle East.

Future Budget Plan

If and when peace is firmly established in the Middle East, the vast sums that now fund military budgets are expected to be switched to support economic development and education.

The futuristic study already envisages a system of at least 35 general and desert universities operating large computer centers from Ankara to Aden and Teheran to Khartoum. These are expected to be linked through data communications systems to work on common solutions to all interrelated problems of the region.

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Claims Agency Bias in Bid

OCR Vendor Protests SSA Benchmark Action

By Edith Holmes
CW Staff

WASHINGTON, D.C. — A small California-based firm has locked horns with the Social Security Administration (SSA) once again.

Information International, Inc. recently charged the SSA with behaving unfairly in an early December benchmark test of the company's microfilm optical character reader (OCR) equipment.

The SSA has offered to let the firm demonstrate its wares again this week, and Information International has agreed. However, the company also lodged a formal protest against the agency's actions with the General Accounting Office.

The firm believes this to be the third time the SSA has shown a preference for paper document OCR machinery in its bid to obtain OCR equipment to read all employer-submitted W-2, W-2P, (pension) and W-3 (summary) earnings statements beginning in 1979.

In an effort to reduce the paper work required of and by the federal government, Congress passed a law eliminating the need for almost five million employers to file quarterly 941 reports with the SSA. Public law 94-202 instead requires the SSA to share earnings information with the Internal Revenue Service.

Needing additional OCR equipment to satisfy this law, the SSA put out a request for proposal (RFP) for multifont scanning devices in July. Information International protested that the RFP did not permit bids from manufacturers of microfilm OCR equipment and, with the help of members of Congress and the Department of Health, Education and Welfare, persuaded the SSA to amend its RFP in August to include microfilm OCRs and to require a benchmark performance test [CW, Sept. 12].

Conversion Penalty

After a revision of the RFP, the SSA informed Information International it would have to assess any microfilm reader manufacturer a $2.5 million penalty in the bid evaluation to cover the estimated extra expense of converting the W-2 paper forms to microfilm. However, the agency is already microfilming most documents for storage purposes, according to Information International's president, Alfred L. Fenaughty.

Fenaughty pointed to statements by the SSA Office of Advanced Planning that microfilming will be continued by the agency well into the 1980s and beyond.

The SSA's estimated costs for microfilming the paper wage forms are too high in any event, Fenaughty added. Kodak as a commercial film processor was prepared to bid $50,000 for this task.

The SSA initially told Information International the high cost of microfilming at the agency was attributable to its employment of handicapped workers. Challenged by the firm on the truth of this contention, the agency adjusted its microfilm penalty to a fraction of the original $2.5 million.

As they approached their benchmark test date of Dec. 5, Information International executives were also told by SSA's Technical Evaluation Committee that the agency planned to evaluate the OCR equipment after screening out 30% of the most illegible and hard-to-scan W-2 forms. Yet nowhere in the amended RFP is there mention of the equipment being allowed to read only 70% of all the wage statements, Fenaughty said.

The RFP plainly states that equipment must be able to scan 100% of all W-2 forms with a low reject rate, Information International's president noted.

In the course of the benchmark test, the SSA told the company that instead of forms prepared directly on typewriters and computer-based line printers, the only materials the SSA would make available for the test were offset-printed facsimiles of the original forms and microfilm made from those facsimiles, an Information International spokesman said. The SSA had filmed 400 original forms and offset-printed these documents for the benchmark test.

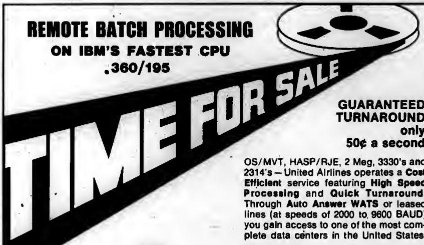
Offset print does not correspond in any way to the anticipated SSA requirement for reading "real world" wage documents prepared by a variety of typewriters and computer printers, the vendor spokesman stated.

Information International told SSA that it was not prepared to run with microfilm made from the offset-printed data and that the material was not representative of the W-2 documents the SSA would actually receive. The firm offered to read images made from the original W-2 forms using conventional microfilming techniques.

Information International also offered to read microfilm made from repeated filming of 400 original test pages, the spokesman noted.

Because neither of these alternatives were acceptable to the SSA committee, its members left the firm. They returned later in the week, however.

Information International used two scanners to demonstrate its readiness, achieving in excess of 80 pages per second or more than 204 forms per second, the spokesman claimed. Only 10 characters out of the total 130,572 characters were unread by the equipment, he added.



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National Semi Unveils Static 64K ROM Chip

SANTA CLARA, Calif. — National Semiconductor Corp.'s NMOS 64K read-only memory (ROM), the MM5235, has a typical access time of 450 nsec, the firm said.

The 28-pin device is a static 8K by 8 chip which requires a single +5V power supply.

National plans to bring out a faster 64K ROM, the MM52164, in February. That will have a maximum access time of 450 nsec and will be configured with the standard 2316E pin out of 24 pins, a spokesman said.

The MM5235 is being promoted for the home computer market, he indicated.

The MM5235 is fabricated with a metal gate technique.

Available in sample quantities, the price of the commercial version is $32 each in lots of 250. In large volumes, the price is expected to be about .025 cent/bit, the firm added.

National is at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Micro Aids Developer

WOODLAND HILLS, Calif. — Comptronics, Inc. announced a single-board microcomputer designed for systems development and evaluation and featuring 2K 8-bit words of random-access memory (RAM).

The Model 1080 F-8 Development Board includes an F-8 CPU, the 2K RAM, sockets for an additional 4K of 2708 memory, a Fairbug program storage unit, a 3853 static memory interface, 32 bits of I/O arranged in four 8-bit ports and two I/O expansion sockets.

The board also features a buffered address and data bus to an S-100 memory expansion connector, 1K of 2708 custom user monitoring and 2.0 MHz crystal and interface circuitry.

The Model 1080 costs $249 as a kit or $299 assembled.

Comptronics is at 19824 Ventura Blvd., Woodland Hills, Calif. 91364.

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Intel Starts LSI Subsystem Series

SANTA CLARA, Calif. — Intel Corp.'s Microcomputer Components Division has started a series of single-chip LSI subsystems with logic functions dedicated to specific classes of peripherals.

Two devices for operating microprocessor-based manual-input and display-output peripherals were announced as starting the series and IBM-compatible controllers for floppy disks and communication links will be added next, the firm said.

The Intel 8275 Programmable CRT Controller and 8279 Programmable Keyboard/-Display Interface are the first peripheral circuits covering "human interface" needs of such CPUs as the 8080A, 8085 micro and 8048 single-chip, the firm claimed.

The 8275 and 8279 chips contain more logic than a microprocessor and intelligence, thereby minimizing the amount of software needed to run peripherals, Intel said.

For example, the 8279's keyboard portion can be initialized and maintained with two or three bytes of program instructions, the firm noted.

Format and control features of the 8275 are fully programmable and the chip does not require memory refresh.

Microcosm

The 8275 chip is the first comprehensive CRT controller with LSI construction, Intel said. It handles main memory refresh and data transfer, some graphics generation, cursor control, light-pen detection, scan control and read-only memory (ROM) character generation, according to the firm.

Display formats and control functions are governed by program commands received through the system bus.

The 8279 keyboard/display interface operates a 64-key keyboard and up to 32 numeric or 16 alphanumeric character readouts, Intel said.

In quantities of 100 or more, the 8275 Programmable CRT Controller is available for $62.50 per unit and the 8279 Programmable Keyboard/-Display Interface for $14.10 per unit.

Intel Corp. is at 3065 Bowers Ave., Santa Clara, Calif. 95051.

8K Prom Introduced

SAN DIEGO — Electronic Solutions, Inc. announced an 8K-byte programmable read-only memory (Prom) board compatible with Intel Corp.'s SBC 80/10 and National Semiconductor Corp.'s BLC 80/10 single-board computers.

Either base address of the Prom-8's two 4K segments can be independently set via jumpers — with base addresses falling on segment boundaries; and the board contains sockets for eight 2708 E-Proms.

The Prom-8 board is available for $186 from Electronic Solutions, Inc. at 7969 Engineer Road, San Diego, Calif. 92111.

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CRT Features Window Ability

PHILADELPHIA — Human Designed Systems, Inc. has a low-cost microprocessor-based CRT called Concept 100 that reportedly offers such features as forms control, text editing, upper/lower case, accents, up to 19 user programmable function keys, line drawing graphics, multiple pages of display memory, multiple character sets and shared printing.

It also offers "windowing" — a feature that permits the application programmer to divide the display memory into any number of separately controllable rectangular areas. These areas can be treated as if they are separate terminal displays, the company said.

Concept 100

The CRT is described by the manufacturer as easy to use with a tilt/swivel nonglare screen.

The Concept 100 will be available at $1,260 per unit in quantities of 50 in February from the company at 3700 Market St., Philadelphia, Pa. 19103.

Memorex Expands Floppies

SANTA CLARA, Calif. — Memorex Corp. has expanded its OEM line of disk drive products with a dual-headed flexible disk drive said to provide enhanced performance and reliability as well as a series of fail-safe features.

The Memorex 552 incorporates two ceramic read/write heads that allow use of both sides of a dual-sided flexible disk, according to a spokesman.

The 552 offers a recording capacity of 492K bytes in IBM 4964 format or up to 1.6M bytes of unformatted data with access time of 3 msec per track, he said.

Data transfer rate is 250 kbyte/sec in single-density recording mode, Memorex noted.

The 552 can reportedly be operated in double-density mode without modification or additional electronics. Data transfer rate in this mode is 500 kbyte/sec, the spokesman claimed.

OEM Products

Four 552 units can be mounted vertically or two can be mounted horizontally in a standard 19-in. rack.

A door-controlled latch/eject mechanism makes cartridge insertion and removal a "pop-in/pop-out" operation, the company said. In addition, a lock stop feature also makes it impossible for the user to close the door on a cartridge that is not fully inserted or removed, providing protection for media disk.

The disks are available now in OEM quantity prices of $585 each from Memorex, San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Intel Offering PDP-11 Memory

SUNNYVALE, Calif. — Intel Memory Systems has announced an add-on memory it said is hardware- and software-compatible with the Digital Equipment Corp. PDP-11/04 and 11/34 minicomputers.

The In-5034 uses high-speed 8K/-16K MOS random-access memory devices to provide 32K, 48K or 64K by 18-bit memory capacity on a card that fits a single PDP-11 hex height card slot.

Reliability features include parity checking and generation and control status register without the need for a DEC parity controller module, Intel said.

The price of a 32K by 18-bit In-5034 memory system is $2,625. The 32K version is available now; the 48K and 64K versions will be available in the second quarter.

Intel Memory Systems is at 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

Fabri-Tek Adds Bulk Core Unit

MINNEAPOLIS — The Fabri-Tek, Inc. Model BCM 760 bulk core memory was designed to replace drum and disk memory devices, main memory and main memory extensions as well as memory buffers on medium- to large-scale computer systems.

Maximum capacity of a single BCM 760 module is 128K words of 20 bits, with 18- and 16-bit word configurations also available.

Maximum addressable memory in any given system is 32 modules, Fabri-Tek said, adding cycle time is 1.5 microsec full cycle with a 500 nsec data access time.

Fabri-Tek will also offer a 64K-word version known as the BCM 750.

A single 128K, 18-bit module costs $5,787, with enclosure and power supply an added $2,965. OEM discounts are available.

Deliveries will begin in the first quarter from the firm at 5901 S. County Road 18, Minneapolis, Minn. 55436.

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PLUS ....

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Customers throughout the U.S. are benefiting from these features now. For more information please contact Bob Beaver; The BRAEGEN Corporation, 20740 Valley Green Drive, Cupertino, California 95014. (408) 255-4200.

BRAEGEN

Tektronix Graphics Display Backs Store-Refresh Mode

BEAVERTON, Ore. — Tektronix, Inc.'s GMA102A 19-in. storage-refresh graphics display for the OEM can store up to 1,575 in. of refreshed vector in the combined store-refresh mode, the firm said.

The unit can be used in the creation of dynamic or interactive displays, Tektronix said.

A basic operational version costs $6,175.

The GMA102A offers both a directed-beam refresh display, which features dynamic movement and selective erase, as well as direct view storage tube (DVST), which features low-cost, high-resolution graphics, the firm stated.

Parts of images may be stored in display phosphor while interactive picture elements can be displayed in refresh, the firm added.

Tektronix GMA102A

Options can increase the storage to more than 8,000 characters and the display to 400 refreshed characters.

There are three modes of operation: store, non-store and store-refresh.

More information is available from mailing station 60-631, Tektronix, Inc., P.O. Box 500, Beaverton, Ore. 97077.

Punched-Tape Reader Bows

IRVINE, Calif. — A punched-tape reader capable of sensing up to 200 char./sec in asynchronous operation and up to 300 char./sec in asynchronous handshake mode is available from the Remex Division of Ex-Cell-O Corp.

OEM Products

The reader can handle 5- and 8-level tapes with standard formats, or 6- and 8-level typesetter tapes. Track format is selected by a single switch on the reader panel.

The RRK 8000 punched-tape reader is contained within a single, cast-aluminum frame and can be panel-mounted in a 4-in. square cutout. The number of moving parts has been reduced by elimination of belts and sprockets, and input power is 24V at 100mA.

The Remex RRK 8000 is presented as a system component with minimum operator interaction that can be directed by the host system to drive tape from left to right or right to left.

The unit is available for $240 in quantities of 500 or more, from Remex Division, Ex-Cell-O Corp., 1733 Alton St., P.O. Box C-19533, Irvine, Calif. 92713.

Keyboard/Display Offered

GRANDVIEW, Mo. — Computerwise, Inc. is offering a rack-mountable keyboard/display unit for use in computer-controlled machines, automatic testers and similar applications.

The unit can be attached to any computer or microprocessor using an asynchronous RS-232 or 20mA current loop I/O port, the firm said. Switch-selectable modes include 110-9,600 bit/sec, full- or half-duplex, even/odd/no parity, 5 to 8 data bits and one or two stop bits. The unit mounts in a standard 19-in. wide rack and is 10-1/2 in high.

A gas discharge display provides a single line of up to 32 alphanumeric characters.

Keyboard options available include a 24-key format, a 53-key full alphanumeric model or a custom configuration.

The standard unit is available in 30 days for $750 in single quantity with discounts available.

Computerwise, Inc. is at 4006 E. 137th Terrace, Grandview, Mo. 64030.

Telex Adds 6250 Tape Unit

TULSA, Okla. — Telex Computer Products, Inc.'s 6,250 bit/in. tape transport, Model 6250, is available in standard 19-in. rack-mount configuration and meets the requirements of .3-in. interrecord gaps in read and write operations, the firm said.

The 6250 is designed to fit PE and GCR data formats while the lower performance Model 6240 operates wiht NRZI and PE data formats. Models are available in 45-, 75-, 100- and 125-in./sec configurations, the firm indicated.

Data transfer is up to 781K bit/sec and the rewind speed is 500 in./sec.

Eight Transports

The 6850 formatter controller can handle up to eight transports and can intermix any combination of up to four speeds and three tape densities, Telex said.

The design of the drive includes a servo control system that uses infrared sensors and a Supr-Lite capstan weighing 1.9 grams.

An optional dual speed and dual access allow two formatters to access the same tape drive while the drive may operate at two different speeds and densities to present a reasonably constant throughput to the CPU, Telex indicated.

In quantities of 100, the drive prices range from $6,995 for the Model 6240 to $7,495 for the Model 6250. The basic controller formatter starts at $6,495 in lots of 100.

Telex Computer Products, Inc. is at 6422 E. 41st St., Tulsa, Okla. 74135.

Control Added To Self-Scan II

PLAINFIELD, N.J. — Burroughs Corp.'s Electronic Components Division has added microprocessor control to its Self-Scan II line of gas plasma displays.

In lots of 100, the displays cost $225 for the 40-character panel; $500 for 240 characters; and $750 for 480 characters.

Burroughs Electronic Components Division may be contacted through P.O. Box 1226, Plainfield, N.J. 07061.

DEC Brings Out Micro for OEMs

MAYNARD, Mass. — Digital Equipment Corp. now has a PDP-11/03-L microcomputer for OEMs that want to configure more powerful systems without adding an expander box.

It features a 9-by-4 slot backplane with six slots for OEM expansion, 32K bytes of MOS memory and space for up to 32K bytes of UV-Prom or read-only memory (ROM) on a single printed circuit board.

A typical CPU, backplane, 32K bytes of MOS memory, bootstrap module with self-test features, 115V-230V AC input box and power supply in a 5-1/4 in. rack-mountable enclosure costs $3,995. Deliveries are 90 days ARO.

DEC's OEM group is in Maynard, Mass. 01754.

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Northfield, IL	312/446-8395
Oak Brook, IL	312/988-0422
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Southfield, MI	313/352-6520
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COMPUTER USER SERVICES COORDINATOR

University computer center seeking experienced college instructor to head Computer User Services area. District academic consulting effort, conduct non-credit mini-seminars of computer resources including IBM 370/138 and time sharing computers, prepare user documentation and special purpose software. Minimum of BS degree in computer technology or related field required. Send resume, salary history and requirements to:

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Systems Analyst

Mapping, Mini and Large Computer Applications

A Northwest electric utility is in need of a Systems Analyst to assist in digitizing our service area maps.

Specific qualifications are: degree in a technical field, command of FORTRAN, COBOL, and an assembly language. Experience with minicomputers and large commercial data processing systems such as 370/158, experience in writing and reviewing hardware/software specifications and in working with vendors. A knowledge of data base structures, interactive graphics, plotting, the State plane coordinate system and common projections used in mapping.

The successful candidate will have from six to ten years of solid data processing experience and will be a heavy individual performer.

If you have most of the above qualifications, contact Roxie J. O'Brien, Senior Employment Coordinator, Portland General Electric Company, 121 S.W. Salmon, Portland, OR 97204.

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PGE
Portland General Electric
121 S.W. Salmon
Portland, OR 97204

Computer Engineer

To join the faculty of Electrical Engineering Department at the University of Southwestern Louisiana. Experience in computer hardware design and its application to engineering problems. Ph.D. in Electrical Engineering or Computer Engineering desired with demonstrated research ability. Accomplishments should include publication and participation in professional organizations. He or she will teach and conduct research. Salary is open to negotiate. The University of Southwestern Louisiana is an Equal Opportunity Affirmative Action Employer and is in compliance with Title IX and Section 504 of the Rehabilitation Act. Mail resume by March 15, 1978 to: William A. Klos, USL, P.O. Box 4-3590, Lafayette, LA 70504.

SENIOR PROGRAMMER ANALYST

PORTLAND, OREGON

Educational organization seeks individual with proficiency in BASIC and SPL (or comparable MACRO language) and familiarity with HP3000 equipment. Minimum requirements: 5 years experience as programmer or systems analyst; experience with educational applications; formal training in systems design or analysis.

Starting salary range: $7.46-$8.23 per hour, 40 hours per week. Initial application materials: letter of application and resume. Closing date: 1/22/78. Apply to MCIED Personnel, P.O. Box 16657, Portland, OR, 97216.

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Assistant or Associate Professor

To begin Sept., 1978. Should hold a Ph.D. and teach well with knowledge of several programming languages. Teaching load about 12 hours (quarter). Send vitae by March 15, 1978 to Dr. James J. Johnson.

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ANALYST/PROGRAMMER

Technical development of Health Care Applications. Ideal candidate's experience should include some of the following:

- Several years mini-computer experience
- Distributed network experience helpful
- Experience in Assembler, FORTRAN/COBOL

For consideration, please submit a resume including references and salary history to:

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Administrative Data Processing. Minimum 2 years systems analyst experience in systems design and implementation using PL/I or COBOL. CICS experience is desired. Familiarity with ADP systems supporting a major university is desirable. Salary range $15,310-21,430. Please apply by January 20, 1978 Personnel Office, 110 Nisbet Bldg., Michigan State University, East Lansing, MI 48824. An Equal Opportunity Employer.

PROGRAMMER/ANALYST

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SYSTEM PROGRAMMERS are needed to participate in our conversion from MVT/HASP to MVS/JES2, to help us establish an effective measurement and evaluation program, to install and support enhanced interactive services, and to develop other subsystems.

APPLICANTS must have a degree in Computer Science or related field and must have demonstrated fluency in S/370 assembler language and a sound knowledge of operating system organization and principles. Also desirable are experience with HASP or JES2 internals, experience with interactive systems, and advanced degree. Salary and responsibilities will be commensurate with education and experience. Send resumé, including education, professional experience, and salary history, to Dr. Donald T. Laird, Director, Computation Center, 229 Computer Bldg., University Park, PA 16802.

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Applicants must have a bachelor's degree, know FORTRAN, and like to do a job from start to finish including problem definition, systems analysis, programming and user training. Experience with 1130-type computers and/or petroleum industry experience would be useful.

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Experience in academic computing is required. Administrative experience in operating a computing facility is desirable. The position may carry a faculty appointment in the appropriate academic department. The salary will be commensurate with qualifications and experience.

Inquiries and applications should be addressed to:

Prof. Glenn M. Frye, Jr.
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Rockefeller Building
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Application deadline is February 1, 1978.

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This position requires 5 years experience in large scale computer system sales, with 2 years experience in sales management. Successful experience in product sales or product planning of memory or communications system is also mandatory.

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This is an excellent opportunity for a talented EDP marketing professional who seeks to broaden his career horizon in a highly rewarding, results-oriented company. Compensation and benefits are competitive and the opportunity for personal growth is outstanding.

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SYSTEMS PROGRAMMER

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ATLANTA

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We have an immediate need for seasoned prog/analysts who are proficient with: COBOL, RPG, IMS CICS & TOTAL. Degree preferred but experience is most important. $16,000-$24,000 (Fee Pd.)

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San Diego opportunity in

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NCR

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The University of Texas

Medical Branch at Galveston has an immediate opening for an experienced Systems Programmer. Join a progressive data processing staff of 70 persons working for the largest, oldest and most prestigious medical school in Texas. UTMB is involved in some of the most advanced research being done in the medical field today. This 1100-bed health care facility provides a constant challenge for the development of new systems. The innovative data processing department offers each employee the opportunity to develop through internal and vendor education programs. On-line, real time, health care support applications provide the backbone of the development environment. Working with a group of four, the person selected will share responsibility for development, testing and maintenance of systems software. This is a dynamic growth environment currently moving from OS/MVT HASP to MVS/JES 2 on a four meg. 370/158. A large teleprocessing network is managed by CICS using DL/I as the DBMS. Qualifications should include a good working knowledge of ALC and 3 years experience with similar systems and equipment. The position provides excellent benefits and a salary commensurate with experience. 50 miles south of Houston, Galveston Island sits just off the Texas coast in the Gulf of Mexico. The town's unique combination of historical (late 1800's) architecture and coastal beach advantages provide a delightful living environment for the employees of the large medical school/hospital complex. Leave your cold weather worries behind and join us in one of the highest growth areas in the U.S.!

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Galveston, Texas 77550
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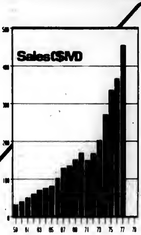

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Your background in design or applications of these products, communications skills and desire to work in marketing is necessary. Experience with microprocessors and ASSEMBLY or high level programming is a plus factor, or for some positions, is a necessity. Formal education might include a BSEE or BSCS plus marketing courses.

Product Managers

Responsibilities will include developing marketing and sales and service support for products in the assigned group. Substantial interaction with engineering, sales, finance, manufacturing and corporate management is necessary.

Necessary experience includes marketing experience in related product areas. Formal education includes a BSEE or BCSC plus an MBA.

Program Supervisors

Persons in these positions implement and monitor marketing and sales programs for their assigned products. In conjunction with product managers, specialists and engineering, they also participate in developing new products proposals, market definition and sales training programs.

Background might include previous marketing experience or hardware/software/ applications engineering with marketing courses. Formal education may also include a BSEE or BSCS, plus marketing courses or an MBA.

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These individuals work directly with our customers and sales engineering providing technical support and applications assistance as well as participating in product planning and market development.

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CALL Art Andersen at 800-547-1164 (Toll free) or collect 503-644-0161, extension 7043 or send a complete resume and salary history to Art Andersen, TEKTRONIX, INC., P.O. Box 500, C56, Beaverton, Oregon 97077.

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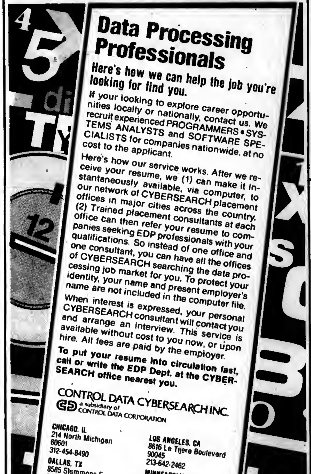

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FLORIDA

SALARY $15-20K

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Jerry W. Meyer
Data Base Administrator
Dept. of Health &
Rehabilitative Services
Office of Management Systems
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Tallahassee, FL 32301

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MSEE or MSCS plus 8 to 10 years experience in designing software packages for real-time computer control systems is required. The selected candidates will act as our divisions technical authority and consultant in software development and may also act as chief programmer on major software systems development.

We offer an excellent compensation package, a modern working environment and good growth potential. Interested parties please submit resume to: Staffing Administrator, HONEYWELL, 1500 W. Dundee Rd., Arlington Heights, Illinois 60004, or call (312) 394-4000, Ext. 304. (Northwest suburb of Chicago).

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Honeywell

ARIZONA STATE UNIVERSITY
COMPUTER CENTER/DATA BASE
SYSTEM SUPPORT STAFF

ASU is recruiting system staff to bring up and support an OS/VS1-IDMS operating environment. The hardware for this data base oriented system will be installed during the summer of 1979. Resume/applications for the following positions will be accepted through 18/January/78. All listed openings are sensitive and require a criminal history record check.

MANAGER SYSTEM SUPPORT

This position has primary responsibility for planning/directing the data base and operating system installation and managing a staff of about 4 system support analyst/programmers. Position reports to the computer center director. Starting salary is $19K-$20K. Requirements for this position include:

- Superior communications skills, both verbal and written
- Thorough knowledge of IBM operating systems
- BS/BA with major in engineering, math, computer science or related field
- 5 years data processing experience (1 to 2 years as manager) and recent OS/VS involvement

SUPERVISOR SYSTEM SUPPORT

This position is essentially a project leader on the system support staff. This person will be responsible for specific projects while directing the efforts of several system support analyst/programmers. Position reports to manager system support. Starting salary is $17.9K-$18.8K. Requirements for this position include:

- Superior communication skills
- Knowledge of IBM operating systems
- BS/BA with major in engineering, math, computer science or related field
- 3 to 4 years DP experience (at least 1 yr in supervision) and have worked on an OS/VS system

SENIOR SYSTEM SUPPORT ANALYST

This position, under general supervision, is responsible for aiding in the design of accounting system, executive modification, etc. Position reports to either manager system support or supervisor system support. Requirements for this position include:

- Good communications skills
- Knowledge of operating systems
- BS/BA with major in computer science, engineering, math, or related field
- 1 to 2 years data processing experience

Starting salary is $16.1K to $17.5K

SYSTEMS ANALYST

Systems analyst to work with IDMS in data base administration group. Experience in database design, implementation, security, and recovery procedures on IBM compatible equipment a must. Degree preferred. Salary to $21K, commensurate with experience.

Send applications/resumes to Arizona State University, Personnel Department, Tempe, AZ 85281. Application period ends 18/January/79. Equal opportunity/affirmative action employer.

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EDP SYSTEMS & PROGRAMMING

The Mount Sinai Medical Center has an immediate opening for the right individual as Manager of EDP Systems & Programming for a 17 person staff in our 270/148 equipped computing center. Applicants must have a suitable background in managing applications development as well as computer languages (COBOL, BAL), operating systems (VM, OS/VS1) and teleprocessing (CICS/VS). Particular expertise in the intervals of the above tools would be most beneficial. Responsibilities of this position include participation in evaluating requests for development of new systems, designing systems solutions and planning development & implementation utilizing project management & controls. This individual will also be expected to plan & manage currently operational system maintenance tasks. Administrative responsibilities will include budgeting, scheduling and personnel recommendations & promotion. The ability to communicate verbally and in writing is essential for this position. Please send resumes, indicating salary to:

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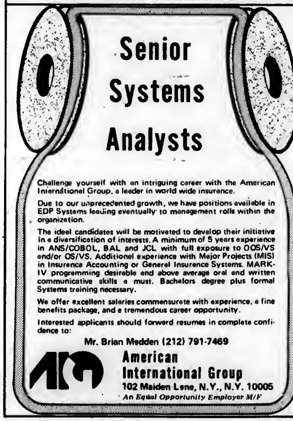

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Washington County, Oregon is seeking a highly motivated Data Processing Systems Analyst/Coordinator to manage its computer acquisition project and develop a new data processing department. Minimum of 5 years of Data Processing experience including systems design, supervision, and project management of on-line systems implementation on medium size hardware is required. Position offers challenge and opportunity to the right person." Salary; $1530-$1953 per month. Send resume to Washington County Civil Service, Administration Building, Room 305, 150 N. First Ave., Hillsboro, Oregon 97123. An Equal Opportunity Employer, women and members of minorities urged to apply.

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SYSTEMS ANALYST

Expert in the area of student records & registration, user oriented background & strong communications skills req. Knowledge of on-line systems & current data processing technology helpful. The analyst will be assigned to the computer center, interface with other offices & assist in the development of a comprehensive university information system.

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Director-Research Institute

University of Petroleum and Minerals

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We are looking for Programmers with BURRDUGHS IPS and/or IBM 370 experience. Minimum of TWO YEARS' experience is necessary.

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The individual will be responsible for installing and maintaining communications networks and coordination with carriers, equipment vendors and user departments, software analysis and computer operations for installation and network maintenance.

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Cleveland State University
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EOE/AAE M/F/H

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You'll work with a high degree of independence —operating, monitoring, analyzing the performance of distributed SCMD PDP-11/70 computer systems. Scope of responsibilities will include developing computer programs that improve operating efficiency and creating standards and procedures consistant with needs of all satellite work stations.

Position requires degree or equivalent industrial experience, strong analytical skills, and three or more years experience on small computer systems—including PDP-11/70. Programming background in FORTRAN or BASIC languages also necessary.

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PROGRAMMER

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(Salary $17K)

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Robert A. Harding
Director, Personnel

University of Lowell

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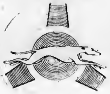

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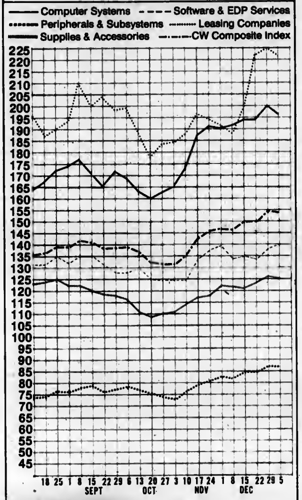

Earnings Reports

MATHEMATICAL APPLICATIONS GROUP
Six Months Ended Sept. 30

	1977	1976
Shr Ernd	$.17	$.05
Revenue	995,336	935,400
Earnings	144,476	44,388

MEDICAL COMPUTER SYSTEMS
Three Months Ended Sept. 30

	1977	1976
Shr Ernd	$.09	$.11
Revenue	2,608,065	2,330,624
Earnings	237,555	308,810
6 Mo Shr	.32	.30
Revenue	7,724,764	6,798,567
Earnings	870,980	618,886

MOHAWK DATA SCIENCES
Three Months Ended Oct. 31

	1977	1976
Shr Ernd	$.16	$.10
Revenue	36,551,000	35,048,000
Tax Cred	30,000	414,000
Earnings	1,236,000	746,000
6 Mo Shr	.41	.29
Revenue	72,466,000	73,994,000
Tax Cred	75,000	859,000
Spec Cred	a676,000	....
Earnings	3,126,000	2,182,000

a-Gain on retirement of debt.

NATIONAL COMPUTER SYSTEMS
Three Months Ended Oct 31

	1977	1976
aShr Ernd	$.45	$.41
Revenue	7,222,000	3,932,000
Earnings	736,600	561,700
a6 Mo Shr	1.08	.88
Revenue	18,683,700	8,585,000
Earnings	1,765,500	1,187,300

a-Adjusted to reflect a 50% stock dividend payable in December 1977.

THRESHOLD TECHNOLOGY
Three Months Ended Sept. 30

	1977	a1976
Loss	$85,101	....

a-Comparable figures unavailable: company changed fiscal year-end to June 30 from July 31.

WYLY
Three Months Ended Sept 30

	1977	1976
Revenue	$17,800,000	$15,400,000
Loss	1,100,000	1,900,000
6 Mo Rev	52,800,000	46,400,000
Disc Op	300,000	(65,300,000)
Loss	2,900,000	69,700,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 4, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1977-78 RANGE 111	CLOSE JAN 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	22- 55	51 1/2	-1 3/4	-3.2
N	BURROUGHS CORP	55- 91	72	- 3/4	-1.0
O	COMPUTER AUTOMATION	18- 30	27	0	0.0
N	CONTROL DATA CORP	20- 29	27 7/8	0	0.0
O	CRAY RESEARCH INC	15- 31	28 3/4	- 1/4	-0.8
N	DATA GENERAL CORP	35- 54	48 5/8	-1 1/8	-2.2
N	DATAPOINT CORP	18- 41	38 3/4	0	0.0
N	DIGITAL EQUIPMENT	37- 53	45 1/4	-1 5/8	-3.4
N	ELECTRONIC ASSOC.	2- 3	2 3/4	+ 1/8	+4.7
A	ELECTRONIC ENGINEER.	8- 14	13 1/4	- 3/4	-5.3
O	FOUR-PHASE SYSTEMS	13- 23	20 3/4	- 1/2	-2.3
N	FOXBORO	32- 54	31 5/8	-17 3/8	-35.4
O	GENERAL AUTOMATION	6- 9	7	- 1/8	-1.7
O	GRI COMPUTER CORP	1- 1	1/2	- 1/4	-33.3
N	HEWLETT-PACKARD CO	69- 87	71 1/8	-2 7/8	-3.8
N	HONEYWELL INC	43- 55	44 5/8	-1 3/8	-2.9
N	IBM	245-286	270 3/4	- 1/4	0.0
O	MANAGEMENT ASSIST	5- 10	9 3/8	+ 1/8	+1.3
O	MICRODATA CORP	7- 18	12	+1 1/8	+10.3
O	MODULAR COMPUTER SYS	5- 9	8 5/8	- 1/8	-1.4
N	NCR	32- 47	38 7/8	- 3/4	-1.8
O	PRIME COMPUTER INC	12- 25	23 3/4	+ 7/8	+3.8
N	PERKIN-ELMER	17- 22	19 3/8	- 3/8	-1.8
N	RAYTHEON CO.	16- 35	32 5/8	-1 1/4	-3.6
N	SPERRY RAND	30- 42	35 7/8	- 1/2	-1.3
O	SYCOR INC	8- 20	19 1/2	+ 1/8	+0.6
A	SYSTEMS ENG. LABS	5- 12	12	+1 1/4	+11.6
A	WANG LABS.	10- 14	13 3/8	+ 7/8	+7.0

LEASING COMPANIES

EXCH		PRICE 1977-78 RANGE 111	CLOSE JAN 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALANTHUS CORP	3- 5	4 5/8	+ 1/8	+2.7
O	BOOTHE COURIER CORP	8- 14	13 7/8	+ 3/8	+2.7
O	COMDISCO INC	10- 15	14 1/4	- 1/2	-3.3
A	COMMERCE GROUP CORP	1- 3	3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	3/4	0	0.0
N	DATRONIC RENTAL	0- 2	1 3/8	+ 3/8	+37.5
A	DCL INC	1- 3	3	- 1/4	-7.6
N	DPF INC	6- 10	8 1/2	- 1/2	-5.5
N	ITEL	13- 22	19 1/2	- 1/8	-0.6
N	LEASCO CORP	19- 27	24 5/8	-1	-3.9
O	LEASPAC CORP	1- 2	1 3/4	+ 1/4	+16.6
O	NPG INC	1- 1	1/8	- 1/8	-50.0
A	PIONEER TEX CORP	5- 11	5 5/8	0	0.0
N	U.S. LEASING	10- 16	13 1/4	- 1/2	-3.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
111 TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1977-78 RANGE 111	CLOSE JAN 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	0- 2	1 3/8	+ 1/8	+10.0
O	ANACOMP INC	7- 10	8 5/8	- 1/8	-1.4
A	APPLIED DATA RES.	5- 10	9 1/8	+ 1/8	+1.3
N	AUTOMATIC DATA PROC	23- 30	28 1/4	- 3/8	-1.3
O	COLEMAN AMERICAN COS	2- 2	1 3/4	0	0.0
O	COMPU-SERV NETWORK	9- 15	11 1/4	0	0.0
O	COMP ELECTION SYSTMS	6- 10	9 1/2	+ 1/4	+2.7
O	COMPUTER HORIZONS	1- 1	1	0	0.0
O	COMPUTER NETWORK	6- 11	9 3/4	- 3/8	-3.7
N	COMPUTER SCIENCES	7- 10	8 7/8	- 3/8	-4.0
O	COMPUTER TASK GROUP	1- 2	1 3/4	+ 1/8	+7.6
O	COMPUTER USAGE	1- 3	1 1/2	- 1/8	-7.6
O	COMSHARE	5- 8	7	- 1/2	-6.6
O	DATA DIMENSIONS INC	3- 5	4 1/2	- 5/8	-12.1
O	DATATAB	1- 2	1 3/8	- 1/8	-8.3
N	ELECTRONIC DATA SYS.	14- 20	15 5/8	+ 1/8	+0.8
O	INSYTE CORP	2- 3	1 1/4	+ 1/8	+11.1
O	IPS COMPUTER MARKET.	1- 2	2 1/4	0	0.0
O	KEANE ASSOCIATES	3- 4	3 3/8	- 1/8	-3.5
O	KEYDATA CORP	1- 2	1 1/4	- 1/4	-16.6
A	LOGICON	7- 17	13 1/8	+ 5/8	+5.0
A	MANAGEMENT DATA	1- 2	1 1/8	0	0.0
A	NATIONAL CSS INC	10- 18	17 5/8	+1 5/8	+10.1
O	NATIONAL DATA CORP	4- 7	7 3/8	+ 1/8	+1.7
A	ON LINE SYSTEMS INC	16- 22	18 1/4	0	0.0
N	PLANNING RESEARCH	3- 6	4 3/8	- 1/8	-2.7
O	PROGRAMMING & SYS	1- 1	3/8	+ 1/8	+50.0
O	RAPIDATA INC	2- 3	2 7/8	0	0.0
O	REYNOLDS & REYNOLD	17- 21	20	- 1/4	-1.2
O	SCIENTIFIC COMPUTERS	1- 4	4	0	0.0
O	TYMSHARE INC	14- 23	22 3/8	- 5/8	-2.7
A	UPS SYSTEMS	4- 5	5	+ 3/8	+8.1
N	WYLY CORP	1- 2	7/8	+	+7.6

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1977-78 RANGE 111	CLOSE JAN 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	10- 16	14 3/4	- 1/4	-1.6
O	ADVANCED MEMORY SYS	7- 9	7 1/2	- 1/2	-6.2
N	AMPEX CORP	8- 11	10	- 1/4	-2.4
O	ANDERSON JACOBSON	3- 6	5	- 3/8	-6.9
N	APPLIED DIG DATA SYS	10- 20	13 1/2	- 1/4	-1.8
O	BEEHIVE INT'L	5- 12	5 7/8	+ 1/4	+4.4
A	BOLT,BERANEK & NEW	7- 9	6 7/8	- 3/8	-5.1
N	BUNKER-RAMO	8- 13	11 1/2	+ 3/8	+3.3
A	CALCOMP	3- 5	2 7/8	- 1/8	-4.1
O	CAMBRIDGE MEMORIES	1- 4	3 3/8	- 1/4	-6.8
N	CENTRONICS DATA COMP	17- 30	18	+ 1/4	+1.4
O	COGNITRONICS	1- 1	1 1/8	- 1/8	-10.0
O	COMPUTER COMMUN.	5- 8	7	- 3/8	-5.0
O	COMPUTER CONSOLES	4- 7	4	0	0.0
A	COMPUTER EQUIPMENT	2- 4	3 1/2	0	0.0
O	COMPUTER TRANSCEIVER	1- 1	1 5/8	+ 1/8	+8.3
O	COMTEN	9- 13	10 1/4	- 3/8	-3.5
N	CONRAC CORP	19- 28	22 1/2	-1	-4.2
O	DATA ACCESS SYSTEMS	4- 5	3 1/4	0	0.0
O	DATA 100	6- 11	9 3/8	- 1/2	-5.0
A	DATA PRODUCTS CORP	9- 19	16 1/2	- 5/8	-3.6
O	DATA TECHNOLOGY	3- 4	4 1/4	0	0.0
O	DATUM INC	1- 2	2	0	0.0
O	DECISION DATA COMPUT	2- 3	1 7/8	+ 1/8	+7.1
O	DELTA DATA SYSTEMS	1- 1	5/8	+ 1/8	+25.0
A	DOCUMATION INC	6- 11	10	- 1/8	-1.2
O	DATARAM CORP	2- 24	21 1/2	+ 1/2	+2.3
N	ELECTRONIC M & M	4- 5	4 1/2	- 1/8	-2.7
O	FABRI-TEK	1- 2	1 1/8	+ 1/8	+12.5
O	GENERAL COMPUTER SYS	0- 2	1 3/4	+ 1/8	+7.6
N	HAZELTINE CORP	8- 12	10 1/4	- 1/4	-2.3
N	HARRIS CORP	28- 47	44 1/8	-2 1/4	-4.8
A	INCOTERM CORP	10- 19	18 1/8	- 1/2	-2.6
O	INFOREX INC	4- 7	6 7/8	+ 1/8	+1.8
O	INFORMATION INTL INC	9- 14	9	+ 1/4	+2.8
O	INTEL CORP	38- 57	44 1/2	+1	+2.2
A	LUNDY ELECTRONICS	3- 6	3 5/8	- 1/4	-6.4
O	MSI DATA CORP	6- 15	13 7/8	- 1/4	-1.7
O	MEMOREX	23- 34	30	- 3/8	-1.2
N	MOHAWK DATA SCI	5- 8	6	- 1/8	-2.0
O	PENRIL CORP	2- 6	6 1/4	+ 1/2	+8.6
N	PERTEC CORP	7- 11	10	- 3/4	-6.9
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 2	2	0	0.0
O	QUANTOR CORP	3- 5	3 1/4	0	0.0
O	RECOGNITION EQUIP	6- 10	7 1/8	- 3/8	-5.0
O	SCAN DATA	1- 2	1	+	+6.6
O	STORAGE TECHNOLOGY	10- 22	21	- 1/4	-1.1
O	T BAR INC	7- 13	13 1/8	+ 5/8	+5.0
O	TALLY CORP.	4- 6	4 1/4	- 1/4	-5.5
A	TEC INC	7- 10	6 7/8	0	0.0
N	TEKTRONIX INC	29- 40	37 1/8	- 3/4	-1.9
N	TELEX	2- 3	3	- 1/8	-4.0
O	WILTEK INC	1- 1	5/8	- 1/8	-16.6

SUPPLIES & ACCESSORIES

EXCH		PRICE 1977-78 RANGE 111	CLOSE JAN 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 8	7 1/4	- 1/8	-1.6
O	BALTIMORE BUS FORMS	1- 4	1 3/4	- 1/8	-6.6
A	BARRY WRIGHT	10- 17	16	- 1/4	-1.5
O	CYBERMATICS INC	1- 1	1	+ 1/8	+14.2
O	DUPLEX PRODUCTS INC	14- 20	20	+ 5/8	+3.2
N	ENNIS BUS. FORMS	6- 8	8 1/4	0	0.0
O	GRAPHIC CONTROLS	13- 18	17	0	0.0
N	3M COMPANY	45- 56	47	-1 1/4	-2.5
O	MOORE CORP LTD	24- 37	26 3/4	- 3/4	-2.7
N	NASHUA CORP	16- 28	18 5/8	-2 1/4	-10.7
O	STANDARD REGISTER	18- 25	21 3/4	0	0.0
O	TAB PRODUCTS CO	8- 19	8 1/8	+ 1/8	+1.5
N	UARCO	18- 22	20 5/8	- 3/8	-1.7
A	WABASH MAGNETICS	10- 15	11 1/2	-1	-8.0
N	WALLACE BUS FORMS	17- 21	20 3/8	- 3/8	-1.8

MSA WINNER PICKS SUPER BOWL WINNER

DENVER 14 DALLAS 9

Picked by J. Donald Bruch, Richmond, Virginia, Winner, MSA Super Pool.

From among 11,786 entries in MSA's 1977 Super Pool, one grand prize winner has survived. He is the winner of four of Fran Tarkenton's Super Bowl tickets and a trip for four to New Orleans to see the game. In addition, two second prizes were awarded. These winners each received two Super Bowl tickets and a trip for two to New Orleans.

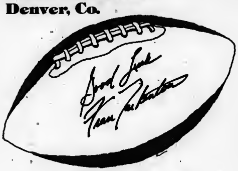
The Winning Teams Were:

Oct. 3
[✓ Oakland] at Kansas City
Oct. 10
Los Angeles at [✓ Chicago]
Oct. 17
Cincinnati at [✓ Pittsburgh]
Oct. 24
Minnesota at [✓ Los Angeles]
Oct. 31
N.Y. Giants at [✓ St. Louis]
Nov. 7
Washington at [✓ Baltimore]
Nov. 14
[✓ St. Louis] at Dallas
Nov. 21
Green Bay at [✓ Washington]
Nov. 28
Buffalo at [✓ Oakland]
Dec. 5
Baltimore at [✓ Miami]
Dec. 12
[✓ Dallas] at San Francisco
Dec. 17
[✓ Minnesota] at Detroit

The Winners

Grand Prize Winner
J. Donald Bruch – Richmond, Va.

Second Prize Winners
Robert E. Saska – Richmond, Va.
Peter C. Williams – Denver, Co.



22 Third Prizes Awarded

The lucky winners of third prizes each received a leather NFL autographed football from Fran Tarkenton and MSA. In a season filled with Monday Night upsets, these winners should be truly proud. They will have a memento from Fran that will remind them that they were among the best pickers of 1977.

Third Prize Winners

M.W. Collins
Houston, Texas

Everett R. Conger
Miamisburg, Ohio

Donald W. Ennis
Indianapolis, Ind.

Robert G. Finn
Meadville, Pa.

D.M. Fitzgerald
San Jose, Ca.

Warren Jarmel
New York, N.Y.

John D. Karen
Denver, Co.

Randy LeBlanc
Baton Rouge, La.

Mary Mackiewicz
Englewood, Colo.

Leila Newkirk
Hot Springs, Ark.

Robert Freeman
Chicago, Ill.

Lowell C. Gaertner
Tecumseh, Mich.

Bill Giannitti
Stamford, Conn.

Barbara J. Granacher
Bellaire, Tex.

Denise Haight
Everett, Wa.

James D. Harrell
Annapolis, Md.

Leonard J. . wak
San Francisco, Ca.

Dale H. Pearson
Des Moines, Ia.

Dick Rehmann
Redondo Beach, Ca.

Daisy P. Scott
Santa Barbara, Ca.

Randy F. Stephens
Statesboro, Ga.

Marguerite Vargo
Gaithersburg, Md.

Congratulations To All

Fran Tarkenton and MSA would like to take this opportunity to congratulate the winners and to thank every one of the over 11,000 entrants in MSA's 1977 Super Pool.

MSA markets a full line of financial software throughout the world and our more than 2,800 users can attest to the fact that you are always a winner with MSA. For more information about our products, call Marge Kimbrough at (404) 262-2376.

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MSA markets financial accounting software packages including: General Ledger, Payroll, Personnel, Accounts Payable, Accounts Receivable, Supplies Inventory, and Fixed Assets

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